

Policy Advice
Knowledge Networks
Capacity Building

impact

Knowledge Transfer

Advisory Boards
Expert Panels
Regulatory Agencies

outcome
Technology Transfer



About the UFZ

Helmholtz Centre for Environmental Research GmbH

Our Vision

The UFZ is one of the world's leading research centres in the field of environmental research and enjoys high social recognition. It offers ways for a sustainable use of natural resources for the benefit of humans and nature.

Our Mission

Biodiversity, functioning ecosystems, clean water and intact soils are our natural bases of life. In light of global change, all staff at UFZ share the objective to demonstrate and promote ways in which excellent research can reconcile social development with a healthy environment. The UFZ is a reliable partner for politics, businesses and civil society in the process of understanding the impacts of human activities on the environment and to develop options for social decision-making processes. Therefore, the UFZ addresses societal challenges and creates knowledge and technologies which help to identify potential conflicts between environmental and societal demands at an early stage and to develop precautionary measures.

Our Structure

The UFZ was founded in 1991 and employs 1,100 people at its locations in Leipzig, Halle (Saale) and Magdeburg. The UFZ is a member of the Helmholtz Association of German Research Centres.

Our Research Structure



Dear reader,

The UFZ carries out excellent research within a wide range of topics related to the environment. It generates sound knowledge and technological solutions for managing our natural resources in a sustainable way which will ultimately benefit society and environment. The transfer of knowledge and technologies to society and business is an integral part of the UFZ mission and activities.

Knowledge Transfer at the UFZ aims to provide options for citizens and decision-makers from the economy, politics and civil societies to address recent or future challenges in the relationship between societies and their environment. On the one hand, UFZ scientists provide scientific analysis and advice on specific problems of environmental politics and administration. On the other hand we are closely involved in the practical processes of environmental politics and administration and well informed about the real-life problems and complex issues to which applied research needs to be tailored.

The selected examples in this brochure will serve as a first insight into our broad range of knowledge transfer activities which include the following topics:

- German Environmental Award 2018
- UFZ Knowledge Transfer Award 2018
- UFZ Communication Award 2018
- UFZ Research Award 2018
- Experts at the UFZ
- Transfer activities & Publications
- Offers & contacts

These examples clarify how the UFZ interacts with its different stakeholders and meets their various needs. They demonstrate the capability of the UFZ to support decisions in societal, economic and political domains and to implement the knowledge needed for sustainable development.

Last but not least, the examples reveal how the UFZ proceeds with regard to its transfer role as stated in the centre's mission.

Interested in further activities or want to join our knowledge network? My colleagues and I will be delighted to hear from you.

Yours sincerely,

Dr. Joachim Nöller
Head of Department
Knowledge and Technology Transfer

P.S.: We are also looking for partners from the private sector for developing technical solutions. Would you like to join forces with us and develop our innovative approaches further into products and production processes – based on your processes and market know-how? Just read our brochure “outcome” or visit our homepage to get a first impression.

You can find further information on our website:
www.ufz.de/knowledgetransfer

IMPRINT

Editor in chief

Dr. Joachim Nöller, Department of Knowledge and Technology Transfer

Layout

Hella Nietsch, UFZ
Susan Walter, UFZ (front cover)

Publisher

Helmholtz Centre for Environmental Research GmbH - UFZ
Permoserstraße 15 | 04318 Leipzig

www.ufz.de

Photos

A. Künzelmann, UFZ (10, 13, 14, 15)
K.-D. Sonntag, foto+design (4, 5, 6, 7, 8)
S. Wiedling, UFZ (3, 9, 17)



Dr. Joachim Nöller
Head of Department
Knowledge and Technology Transfer

E-mail: joachim.noeller@ufz.de
Phone: 0049 341 235-1033



Dr. Manfred van Afferden, Prof. Roland A. Müller, Dr. Mi-Young Lee and Wolf-Michael Hirschfeld



... were honoured for developing principles for a decentralised wastewater management solution in Jordan, and for helping to implement it at the political level.

Two environmental biotechnologists, Prof. Roland A. Müller and Dr. Manfred van Afferden, and the economist Dr. Mi-Yong Becker (née Lee), all of them scientists at the UFZ, plus Wolf-Michael Hirschfeld, initiator of the Training and Demonstration Centre for Decentralised Sewage Water Treatment (BDZ), jointly received the German Environmental Award from the German Federal Environmental Foundation (DBU). The Leipzig-based team of experts shared the environmental prize with marine biologist Prof. Antje Boetius.

Drinking water polluted with faeces is a problem for around two billion people worldwide. However, only 20 % of the global wastewaters are being treated properly. In the rural areas of Jordan alone, 45 million m³ of wastewater per year reach the groundwater without any or with inadequate treatment only. Against this background, the prize-winning team has been working in Jordan since 2006 as part of the research group on Integrated Water Resource Management funded by the Federal Ministry of Education and Research (BMBF), focussing on groundwater protection by

treating and reusing wastewater. They developed an actively aerated horizontal and vertical filter system. It stands out due to its high water and energy efficiency, operational robustness and treatment performance. It can also be target controlled, for example with regard to removing nitrogen and pathogenic bacteria. Beyond the application of the technology in Jordan, it was also included in the technical guidelines of the German Association for Water, Wastewater and Waste (DWA) 2017, i.e. the filter systems now define the German standard of technology in wastewater treatment.

In Jordan, the UFZ started up a research and demonstration site in 2010 at which eleven water treatment plants were operated, developed and adapted to Jordanian conditions. The site also acted as an information platform to exchange experience between citizens, local and regional decision-makers, students and scientists. On the other hand, training activities for pupils, students, scientists as well as specialist personnel from companies and authorities are carried out here. In 2012, the UFZ, funded by the BMBF and the Jordanian Water Ministry, established the Implementation Office for decentralised wastewater management in Amman. The local presence in the Jordanian Water Ministry helped to facilitate stakeholder acceptance and achieve the implementation of the innovative wastewater management approach. The team also developed a practical decision support tool which helps to plan future wastewater management projects. It takes into account geographical, technical and socio-economic data and helps to prevent planning errors and thus reduce investment risks.

Finally, when the Jordanian cabinet passed the first political framework for decentralised wastewater management in the Arab world in 2016, the German team was actively involved in this. According to the political message, decentralised wastewater systems will in future be used nationwide to protect the groundwater resource. This vision has also drawn other countries' attention and a collaboration of the UFZ with the Sultanate of Oman is already picking up steam, with joint R&D currently under way.



"In an unprecedented project in Jordan, the Leipzig team of experts has shown how the water shortage in one of the most severely affected countries can be successfully overcome with a holistic, innovative approach. It has set the course for a better future for Jordan, in which a large part of the population will have access to clean drinking water and wastewater will be treated efficiently."

Prof. Otmar D. Wiestler
President of the Helmholtz Association

"With their conviction that effective water protection can be achieved through decentralised wastewater treatment, the interdisciplinary team of experts has developed innovative system solutions in a difficult political environment and helped to make them consensus and put into practice."

Alexander Bonde
DBU Secretary General

"I am very pleased that the excellent work of our Leipzig team has received such extraordinary recognition with the German Environmental Award. The project is a prime example of the problem-oriented, interdisciplinary way of working at the UFZ. [...]. The team of applicants has thus helped decentralised sewage systems in Germany and abroad to make a breakthrough and is making an important contribution to achieving the United Nations Sustainable Development Goal 6, which aims to ensure the availability and sustainable management of water and sanitation for all."

Prof. Georg Teutsch
Scientific Director of the UFZ



"Against the background of climate and demographic change, we also see great application potential for decentralised water infrastructure systems in Europe's fast-growing cities, for example in the design of resource-efficient urban quarters. [...]

I am particularly pleased that our interdisciplinary approach was appreciated. The successful implementation of the project was only possible because we were able to work very closely, cross-disciplinarily and together with our partners on the holistic implementation of the system solution over a longer period."

Prof. Roland A. Müller
Head of Centre for Environmental Biotechnology at the UFZ

Source: UFZ press release

With a prize money of €500,000, the German Environmental Award, which is awarded annually by the DBU, is the largest environmental prize in Europe. The DBU award is in recognition of personalities who contribute or have contributed to protecting the environment in an exemplary manner.

Prof. Roland A. Müller & Dr. Manfred van Afferden
Department of Environmental and Biotechnology Centre

E-mail: roland.mueller@ufz.de & manfred.afferden@ufz.de
Phone: 0049 341 235-1275 & 1848



UFZ Knowledge Transfer Award 2018

Dr. Hans-Hermann Thulke and Dr. Martin Lange



... were honoured for their many years of model-based policy advice in crisis situations caused by the spread of animal diseases that are associated with risks for humans, the environment and the economy.

African swine fever (ASF) continued to spread compared to the previous year. New outbreaks far from the actual centre of the epidemic in north-eastern Europe have been recorded in Romania and Bulgaria, among others. And even in Belgium, only 60 kilometres from Germany, numerous dead wild boars have been found. It is obvious that the virus found its way to Belgium only through unintentional introduction by humans and not through natural spread by wild boar and free-range domestic swine. There is great concern in the EU that African swine fever may suddenly occur everywhere, causing major economic damage.

The UFZ modelling team led by Dr. Hans-Hermann Thulke was therefore commissioned by the European Food Safety Authority (EFSA) to deal with three different baseline scenarios and to assess current management measures for African swine fever. In the first scenario they looked at ASP-free areas located far from the current centre of the epidemic; in the second one at ASP-free areas located close to ASP areas and therefore at higher risk of natural spread of the disease via feral pigs; and in third scenario, they

assessed areas where the virus suddenly occurs in the form of an isolated case, far from the current human spread of ASF, and where rapid action is required due to the spread via humans. Dr. Thulke based his analyses on 20 years of experience that the UFZ has gained in modelling for the control of rabies, foot-and-mouth disease and ASF.

The results showed, among other things, how important it is to collect and dispose of dead wild boars quickly under the strictest hygiene conditions. This is the only way to prevent the infection of still healthy wild boars by the dead members of the same species.

However, these management considerations for combating African swine fever only make sense with isolated cases. If the virus is already present over a large area and long borders have to be protected, the simulations showed that the focal control approach is no longer effective. This matches the practical experience that the epidemic can hardly be prevented from spreading once it has become established.

Publication:

Epidemiological analyses of African swine fever in the European Union (November 2017 until November 2018) European Food Safety Authority (EFSA), Anette Boklund, Brigitte Cay, Klaus Depner, Zsolt Földi, Vittorio Guberti, Marius Masiulis, Aleksandra Miteva, Simon More, Edvins Olsevskis, Petr Satran, Mihaila Spiridon, Karl Stahl, Hans-Hermann Thulke, Arvo Viltrop, Grzegorz Wozniakowski, Alessandro Broglia, Jose Cortinas Abrahantes, Sofie Dhollander, Andrey Gogin, Frank Verdonck, Laura Amato, Alexandra Papanikolaou and Christian Gortazar;

Scientific report: [Epidemiological analyses of African swine fever in the European Union](#)

Dr. Hans-Hermann Thulke, Dr. Martin Lange
Department of Ecological Modelling

E-mail: hans.thulke@ufz.de, martin.lange@ufz.de
Phone: 0049 341 235-1712, -1716

UFZ Communication Award 2018

Dr. Christian Schmidt



... was honoured for his outstanding commitment and the exceptionally large national and international media response to his work on "Plastic transport through rivers into the oceans".

Every year, millions of tons of plastic waste end up in the sea - a global environmental problem with unforeseeable ecological consequences. In order to be able to reduce plastic waste, it must be clear how the plastic gets into the sea. Little has been known about this so far. Now it has been investigated by an interdisciplinary research team headed by the UFZ.

In its study in the Environmental Science & Technology journal on global plastic waste discharges through rivers into the sea, the team led by Dr. Christian Schmidt was able to show that ten large river systems worldwide are responsible for 90 % of plastic waste discharges into the oceans. His lecture on "Plastic waste – transport through rivers" at the meeting of the European Geosciences Union (EGU) in Vienna in April 2017 led to a first inquiry regarding participation in a press conference on this topic at the meeting. In October 2017, his study was published in the Environmental Science & Technology journal (Schmidt, C., Krauth, T., Wagner, S. (2017): Export of Plastic Debris by Rivers into the Sea. Environ. Sci. Technol.) as an "embargoed release" with an upstream international press release. Radio programme contributions

for Deutschlandfunk Nova, SWR2 or ABC-Australia, articles for print media like Frankfurter Rundschau, Washington Post and Scientific American as well as Internet contributions for Deutsche Welle and n-tv followed and prove the broad media interest in the work.

In future studies, the UFZ team wants to find out how long it takes for plastic waste to reach a river before it reaches the sea. Does it only take a few months or decades? This is important to know because the effect of a measure only becomes noticeable with a corresponding delay, as many contaminated sites are first washed into the sea. Only if we know the approximate time frame of the residence times of the plastic waste in the respective river system can a measure to improve waste management in the catchment area be evaluated.

Publication:

Schmidt, C., Krauth, T., Wagner, S. (2017): Export of Plastic Debris by Rivers into the Sea. Environ. Sci. Technol. DOI: 10.1021/acs.est.7b02368

Scientific report: [Export of Plastic Debris by Rivers into the Sea](#)

Dr. Christian Schmidt
Department of Hydrogeology

E-mail: christian.schmidt@ufz.de
Phone: 0049 341 235-1986



UFZ Research Award 2018

Dr. Martin Drechsler, Dr. Karin Johst and Prof. Frank Wätzold



... were honoured for the development of ecological-economic modelling.

The team was honoured for its outstanding research work in the field of ecological-economic modelling, the development of software for the design of policy instruments based on this, and its many years of integration work at the interface between the natural and social sciences.

In the course of energy system transformation, for example, the team has developed ecological-economic models that deal with the socially and environmentally compatible spatial distribution of energy infrastructures in landscapes. Among other things, it was investigated how wind turbines in western Saxony should be spatially distributed in order to adequately take into account not only the electricity production costs but also negative external effects of wind power production, such as the nuisance to residents and victims in the red kite population. It turned out that such external effects have a large influence on the economically optimal distribution of wind turbines.

Another concrete product of their cooperation is the DSS-EcoPay application software. It is a planning and consulting instrument with which agri-environmental measures can be made ecologically more effective and cost-efficient. Background: In order to halt the

loss of biodiversity, farmers receive state compensation payments if they voluntarily decide to farm in a species-friendly manner. These agri-environmental measures should be designed to protect as many species as possible in a cost-effective way. This is a highly complex task because potentially many different conservation measures with different effects on species can be promoted. In addition, the costs of these measures and their effects vary depending on where and when they are implemented. The authorities must therefore select measures and payments to farmers in such a way that the protection of as many species as possible is maximised according to their budget. DSS-EcoPay is able to record these complex interactions of ecological and economic parameters and evaluate them in a policy-relevant way. User workshops and demonstration projects in various German federal states and in Belgium have already demonstrated this.

Software tool: [DSS-EcoPay](#)

Dr. Martin Drechsler
Department of Ecological Modelling

E-mail: martin.drechsler@ufz.de
Phone: 0049 341 235-1713

Our Experts

Department of Ecological Modelling

E-mail: hans.thulke@ufz.de
Phone: 0049 341 235-1712



Dr. Hans-Hermann Thulke

has a degree and a PhD in mathematics from the University of Leipzig. Before joining the UFZ, he worked at the Federal Research Centre for Animal Health, Wusterhausen/Dosse (Germany). After that, he was a post doc at the UFZ. He has been a senior scientist at the Department of Ecological Modelling at the UFZ since 2015. Currently, he is head of the project group of Ecological Epidemiology.

Hans-Hermann Thulke belongs to the Expert Panel on Animal Health and Animal Welfare advising the European Food Safety Authority (EFSA), the outcomes were used for example as basis for the EFSA Intervention Plan approved in October of 2017. He was Vice-Chairman of this EFSA Panel until mid-2018.

EFSA provides scientific advice to the European Commission, the European Parliament and EU Member States in the field of food safety. Each year it publishes a report on ASP for the EU Commission, which not only reflects the current epidemiological situation on ASP in the EU countries, but also addresses specific issues.

Research interests: ecological epidemiology, modelling transmission - the finite and the infinite world, management-oriented disease modelling, quantitative assessment in animal welfare, good modelling practise for animal health, disease spread and pattern formation, bovine virus diarrhoea control

Personal website of [Dr. Hans-Hermann Thulke](#)

Department of Ecological Modelling

E-mail: martin.lange@ufz.de
Phone: 0049 341 235-1716



Dr. Martin Lange

has a degree in Geoecology from the TU Bergakademie Freiberg. He joined the UFZ in 2005. He has been a PhD student at the UFZ since 2009. Currently, he works in the project group of Ecological Epidemiology on the research systems "Infections in Wild Boar – African Swine Fever, Classical Swine Fever, Foot-and-Mouth Disease" and "Small Foxtape Worm and Red Foxes".

His prediction methodology is based on a formal algorithm to exploit real spatial-temporal data for the calibration of dispersion and management predictions. Dr Lange combines rule-based model structure with a management-oriented interface. This approach provides the unique possibility to test action measures 1:1 in the model environment. Thus in the short time frame of crises important action knowledge is generated BEFORE the usual trial and error approach takes place.

Research interests: ecological epidemiology, individual-based modelling, disease management, Classical Swine Fever, metapopulations, spatial optimisation

Current research activity: Spatially-explicit, individual-based modelling of Classical Swine Fever in Wild Boar (*Sus scrofa*) populations. Objective is the assessment and optimization of disease control measures, particularly vaccination, within the frame of the EU project CSFV_goDIVA.

Personal website of [Dr. Martin Lange](#)



Transfer Activities

“WILDE MULDE“ Project

Restoring a wild river landscape in central Germany

In November 2018, the “WILDE MULDE” floodplain project was certified to be an official project of the UN Decade of Biodiversity, as it strongly contributes to the preservation of biodiversity. The aim of the project, which has been ongoing since the end of 2015, is to revitalise a section of the river Mulde and its floodplains with scientific support.

Major flood events in January 2011 and in June 2013 inundated most of the project areas and showed that the floodplain is still functioning when sufficient inundation is provided. The city of Leipzig in cooperation with the neighboring city of Schkeuditz and the NGO NABU Saxony is responsible for the coordination and the implementation of the technical measures. UFZ is the coordinator of the scientific part for the project and, together with the University of Leipzig, contributes to the planning of the restoration measures and evaluates their ecological and societal effects.

During the first part of the project, which has already been implemented, the water supply of a former dredging area has been restored, increasing the water supply and dynamics in the most important amphibian habitats in the area. The creation of the new river itself is in the planning stage, first construction work is planned to be started in 2019.

Scientific studies of the status-quo pre-implementation and monitoring of the dynamics of floodplain species and habitats as well as the hydrological dynamics by UFZ in collaboration with the University of Leipzig have provided basic input for the planning and on-going refinement of revitalization measures. The “Lebendige Luppe” project, in cooperation with the “Wilde Mulde” restoration project, for which UFZ also is responsible of the scientific coordination, will serve as a pilot character and will develop a blueprint for river and floodplain restoration in other regions.

UFZ is uniquely positioned to integrate scientific expertise from different research areas, such as soil science, hydrology, ecology, conservation biology, modeling, and social sciences. Using the experience

and expertise through integrative approaches UFZ is not only expanding its international recognition and role in floodplain research, but also provides newly gained knowledge essential for the management of floodplains for the benefit of society.

In this transfer process the UFZ is closely collaborating with regional stakeholders, such as the Ministries for Environment in Saxony and Saxony-Anhalt, Elbe-Brandenburg River Landscape Biosphere Reserve, the City of Leipzig, the City of Dessau, various NGOs, national stakeholders, such as the Federal Agency for Nature Conservation, Federal Agency for Environment and the Federal Institute of Hydrology, and European stakeholders, such as the European Environmental Agency. The UFZ supports these stakeholders, especially NGOs, through outreach activities to the general public (for example WWF Germany, Nature and Biodiversity Conservation Union – NABU).

[“WILDE MULDE” project](#)

Contact: **Dr. Christiane Schulz-Zunkel**
Department of Conservation Biology, UFZ
christiane.schulz@ufz.de



Mulde river landscape

Transfer Activities

Pesticide residues in soil

UFZ researchers develop model for improved prediction of toxic residues in soil

The use of pesticides can lead to a build-up of toxic and ecologically harmful residues in the soil. Until recently, it was not possible to ascertain in detail to which pesticides this applies and to what extent.

Researchers from the UFZ, working in partnership with colleagues from the Technical University of Denmark (DTU), have developed a model which allows the formation of potentially toxic residues to be more accurately predicted. The model is based on an analysis of the chemical structure of the respective pesticide, which is examined in detail to determine whether it can be utilised by bacteria. The result of the prediction is the proportion of toxicologically relevant residues that often can't be degraded any further by microorganisms, so they can be really toxic and harmful to the soil.

For the study, the scientists modelled the biogenic residues of 40 different pesticides and compared them with measured values from soil tests carried out as part of the chemical approval process, in which the amounts of biogenic residues from these pesticides were determined. The model calculations largely correlate with the actual measured values and demonstrate that there will be no longer need for time-consuming tests series. There is a good chance that it will be used in the approval process of the European Chemicals Agency (ECHA). The study appeared in “Environmental Science and Technology”.

Scientific report: [Prediction of the Formation of Biogenic Nonextractable Residues during Degradation of Environmental Chemicals from Biomass Yields](#)

Contact: **Prof. Matthias Kästner**
Department of Environmental Biotechnology, UFZ
matthias.kaestner@ufz.de



Agricultural vehicle sprays pesticides



Transfer Activities

Water Resources Management in Central Asia

Development and implementation of strategies for the model region Mongolia (MoMo project)

The Kharaa River Basin suffers from a series of problems, including the effects of global climate change, diffuse pollution, mining impacts, lacks of adequate water supply and sanitation infrastructure, endangered ecological functions of rivers and continuing deterioration of riparian land resources. These are good representatives of difficulties faced in other river basins of the water scarce Central Asian region.

The key objective of the “Model Region Mongolia” Project (MoMo) was the development and implementation of strategies leading towards an Integrated Water Resource Management (IWRM) for the Mongolian Model Region, the Kharaa River Basin (one of the most populated areas of Mongolia), comprising untouched upstream forests, as well as mining areas and the large city of Darkhan. Knowledge on local ecological conditions in Mongolia was generated by intensive research on hydrologic conditions, water quality, sediments and aquatic biota. The data is stored in an online [Geo-Data Base](#).

For more than twelve years, some 120 researchers under the direction of the UFZ and in close cooperation with Mongolian partners investigated the question of how Mongolia can make its water management sustainable. On the Mongolian side, 15 scientific institutions and authorities participated, including the Ministry of Environment and Tourism, the Ministry of Finance, the Ministry of Education and Science and the Ministry of Construction and Urban Development. One focus was the synthesis of fishery ecological research results and their consequences for the management of protected areas, biodiversity and fisheries in Mongolia. The project was completed at the end of the year and is regarded as a blueprint for how the triad of science, testing of technical processes and broad implementation in practice can sustainably solve typical problems associated with globalisation, climate change and transformation, especially in emerging countries.

On the one hand, Mongolian scientists are continuing the environmental monitoring that MoMo once started in their own research project. On the other hand, at the final conference in May 2018, the MoMo researchers presented political recommendations for six thematic areas on which the scientists had agreed with representatives of the Mongolian ministries and the National Academy of Governance. These Policy Briefs describe, for example, for the areas of [urban water management](#), environmental monitoring and capacity development, how MoMo results describe the way to the meeting of the MoMo Project Advisory Board, in which important representatives of national Mongolian ministries and relevant local authorities sat alongside German and Mongolian scientists. This committee was the most important interface for the exchange of information between project leaders and local stakeholders, such as MoMo results that can find their way into policy and thus into laws, guidelines or concrete funding programmes. In two years' time, the German researchers and their Mongolian colleagues will evaluate which of the recommendations have been implemented or what still hangs in the balance.

The [IWRM MoMo project](#) was funded by the German Federal Ministry of Education and Research (BMBWF) and supervised and supported by the Project Management Jülich (PTJ) in the framework of the „Research for Sustainable Development“ (FONA) program.

Contact: **Prof. Dietrich Borchardt**
Department of Aquatic Ecosystem Analysis, UFZ
dietrich.borchardt@ufz.de



Transfer Activities

TEEB analysis “Naturkapital Deutschland“

Final report handed over to the Federal Environment Ministry

Based on the TEEB study (The Economics of Ecosystems and Biodiversity, 2007 to 2010) conducted by the United Nations, the national follow-up project “Naturkapital Deutschland – TEEB DE“ II was conducted between 2012 and 2018 under the direction of UFZ researcher Professor Dr. Bernd Hansjürgens (Department of Economics). On 25.09.2018 the final report of “Naturkapital Deutschland – TEEB DE“ was handed over to Parliamentary State Secretary Rita Schwarzelühr-Sutter at the Federal Environment Ministry. The aim of this study was to economically evaluate ecosystem services and their potential in order to better integrate them into nature conservation decision-making processes and to reconcile them with human interests. These were in particular services provided by nature, most of which are not covered by markets: Regulatory services, cultural services and supporting services. The core statement of the final report is that intact ecosystems have great economic value for Germany and that their impairment causes enormous economic costs.

Examples for the assessment of ecosystem services are pollination services by insects, on which an economic value of products depends, estimated at 1.1 billion euros per year for Germany, or urban nature. City parks ensure that the built environment is supplied with cold air masses and thus protects the population from health problems in hot summers. In addition, it was determined that improving air quality in cities could save annual costs of about 31 billion euros, with trees alone, whose leaves act as natural dust filters, being able to reduce this pollution by five to ten percent.

Within the framework of the “Naturkapital Deutschland – TEEB DE“ study, several hundred cars and experts from science, associations and politics worked together. The main products are thematic reports and brochures describing case studies, studies and concepts. In addition, it was shown how existing instruments for the conservation and sustainable use of

nature and ecosystem services can be improved and expanded.

Furthermore, the TEEB process was continued at the international level in projects with UFZ participation, e.g. the ECO-BEST project of Prof. Dr. Heidi Wittmer (Department of Environmental Policy), in which economic incentives for the local population in South East Asia were investigated in order to stop the loss of terrestrial biodiversity.

The success of this study is that there has been a rethink in politics and the concept of ecosystem services has arrived in politics, business and science.

Final report: [Werte der Natur aufzeigen und in Entscheidungen integrieren](#) (in German)

Contact: **Prof. Bernd Hansjürgens**
Department of Economics UFZ
bernd.hansjuergens@ufz.de



Rural area near Halle (Saale)



Transfer Activities

Improved water quality in Europe's rivers

Final conference of the EU project SOLUTIONS, June 2018, UFZ

Many of Europe's rivers contain mixtures of chemicals. Although the concentrations of some pollutants are monitored in the EU's water bodies, there are doubts as to whether monitoring focuses on the right substances and what role is played by transformation products and combinations of substances.

In the European project SOLUTIONS, led by the UFZ since 2013 has developed tools, methods and practical solutions for identifying substances that require priority treatment, assessing the risk posed by chemical mixtures, and minimising the pollution burden. SOLUTIONS scientists have developed and improved numerous models to assess the distribution, transport, degradation and risk of pollutants, thus supporting environmental monitoring. To be able to predict the concentrations of thousands of substances in European river basins, they have linked the models like wagons in a railway train.

At the final conference in Leipzig, project members from 39 institutions in 14 European countries as well as China, Brazil and Australia met to discuss their results with stakeholders and end users from government and public authorities.

The scientific results and recommendations of SOLUTIONS were published within 14 Policy Briefs to topics like "Diagnosis & management of chemical pollution", "Chemical screening tools", "Prioritization of water pollutants" or "Coherent regulation".

[SOLUTIONS project](#)

Publication (Open Access Paper): Brack et al., Environ Sci Eur (2019) 31:10 "Effect-based methods are key. The European Collaborative Project SOLUTIONS recommends integrating effect-based methods for diagnosis and monitoring of water quality."

Contact: **PD Dr. Werner Brack**
Department of Effect-Directed Analysis, UFZ
werner.brack@ufz.de



Aquatic biology - indicator of the water quality

Transfer Activities

Risk assessment of chemicals

Fish embryo model to analyze the effects of chemicals and their possible harmful effects

With the number of chemicals, their mixtures and the growing variety of protection goals, it is no longer viable to test every chemical in detail.

The fish embryo model can be used to identify neurotoxic effects of movement behavior in fish embryos and to analyze phenotypic changes and gene expression. The model is used in the context of the so-called AOP concept (adverse outcome pathway).

To transfer the results into the screening and test procedure for the regulation of chemicals, the UFZ works closely with external partners and decision makers from different regulatory agencies (e.g. UBA, ECHA, Cefic, L'Oréal, Sanofi, BASF). For example, a symposium organized with L'Oréal in 2018 took place for the fifth time.

In addition, in a BMBF-funded project, the UFZ has developed software that allows detection of toxic effects on the embryonic development of fish by automatic image analysis. This software is provided to the community under a copyleft license of the GNU General Public License Version 3 of the Free Software Foundation (www.fsf.org). A user workshop by the UFZ is planned for the beginning of 2019.

[FishInspector](#)

Contact: **Dr. Stefan Scholz**
Department of Bioanalytical Ecotoxicology, UFZ
stefan.scholz@ufz.de



Zebrafish (*danio rerio*)



Publications **Our contact**

“Light pollution – A Global Discussion”

E-book on the research project “Light Pollution“

Light pollution can be described as the inappropriate or excessive use of artificial light at night (see darksky.org).

In recent years, public concern about the environmental and health effects of light pollution has increased, particularly in North America, Europe and some Asian cities.

The research project “Light Pollution: A Global Discussion” explores current expert perspectives and aims to further the discussion about artificial lighting and light pollution at an international level. The aim is to identify debates and common problems in the fields of lighting and light pollution mitigation and share them broadly to raise awareness for the topic.

The e-book presents the outcome of three expert group discussions and the results of an online expert survey. The expert responses from around the world address crucial questions of light pollution mitigation.

About the project: [“Light pollution – A Global Discussion”](#)

Contact: **Dr. Nona Schulte-Römer**
Department of Urban & Environmental Sociology, UFZ
nona.schulte-roemer@ufz.de



[free PDF download](#)

edited by
Nona Schulte-Römer (UFZ), Etta Dannemann, Josiane Meier
December 2018

“Citizen Science”

Innovation in Open Science, Society and Policy

Citizen science, the active participation of the public in scientific research projects, provides an integrated model of public knowledge production and engagement with science. As a growing worldwide phenomenon, it is invigorated by evolving new technologies that connect people easily and effectively with the scientific community.

In cooperation with the German Centre for Integrative Biodiversity Research (iDiv), UFZ scientists presented a position paper for the Federal Ministry for the Environment (BMU), which shows the need for action and measures for the promotion of Citizen Science in environmental education and environmental communication.

In addition, UFZ scientists together with 122 authors from 19 countries published the Open Access book “Citizen Science – Innovation in Open Science, Society and Policy“ in October 2018. The book identifies and explains the role of citizen science within innovation in science and society, and as a vibrant and productive science-policy interface. The scope of this volume is global, geared towards identifying solutions and lessons to be applied across science, practice and policy.

Contact: **Susanne Hecker**
Department of Ecosystem Services (UFZ) & iDiv
susanne.hecker@ufz.de



[free PDF download](#)

edited by
Susanne Hecker (iDiv/UFZ),
Muki Haklay, Anne Bowser,
Zen Makuch, Johannes Vogel
& Aletta Bonn (iDiv/UFZ)

October 2018



Dr. Joachim Nöller
Head of Department
Knowledge and Technology Transfer

E-mail: joachim.noeller@ufz.de
Phone: 0049 341 235-1033

Reply coupon

I would like to receive more information on:

- Research contacts at UFZ
- Science-based advice and concepts
- Collaboration

Thematic areas at UFZ:

- Environmental Engineering and Biotechnology
- Ecosystems of the Future
- Water Resources and Environment
- Chemicals in the Environment
- Smart Models and Monitoring
- Environment and Society

Your contact:

First name
 Name
 Title
 Company
 Address
 Country
 Phone
 E-mail