

DANUBE WATCH

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FOCUS ISSUE ON



6 CONCLUSIONS
FROM THE JDS 3, THE
DANUBE'S LARGEST
RIVER RESEARCH
EXPEDITION

24 ICPDR PRESIDENCY
2015

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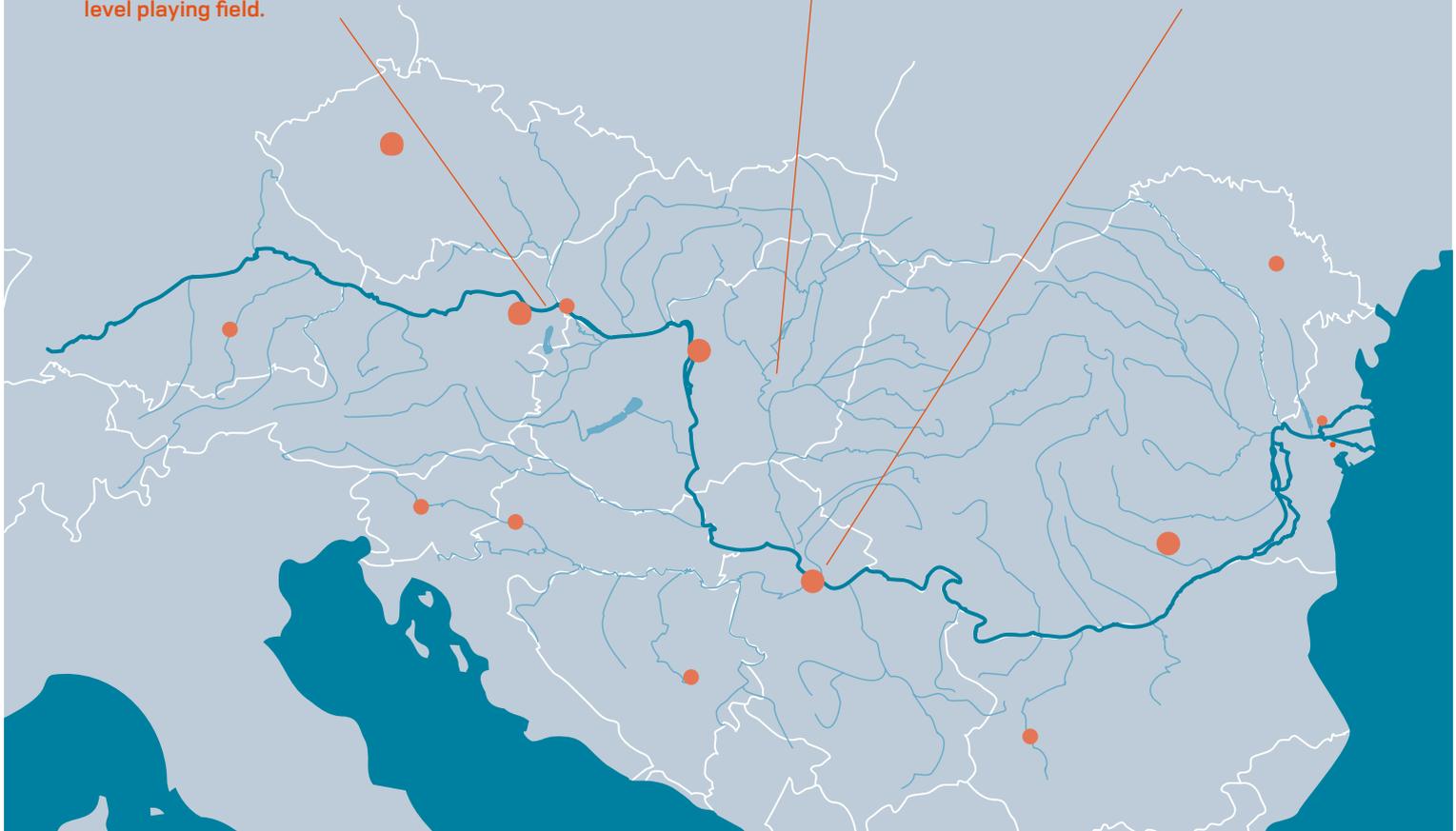
International
Commission
for the Protection
of the Danube River
Internationale
Kommission
zum Schutz
der Donau

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Bad Deutsch-Altenburg,
Austria
To find a balance between navigational and environmental interests in a project to stabilise a 3-kilometre stretch of the river bed downstream of Vienna, organisers created a stakeholder forum to provide a fact-based and constructive dialogue on a level playing field.

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Szolnok, Hungary
The national Tisza Office has been established to support the ICPDR Tisza Group activities and to undertake national tasks related to the sub-basin to build regional cooperation in the framework of the EU Strategy for the Danube Region.

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Belgrade, Serbia
The OSCE's Economic and Environmental Forum – the organisation's annual three-part event on select economic and environmental issues that can impact security – will hold a second preparatory meeting on increasing security and stability through water governance.





Dear readers,

The Joint Danube Survey 3 (JDS3) was the world's biggest river research expedition undertaken in 2013. Its main goal was to produce highly comparable and reliable information on water quality and pollution for the entire Danube River and many of its tributaries, and to raise awareness about the importance of the river and sustainable water management.

The survey is one of the results that have come out of the Danube River Protection Convention (1994) and the obligations of the 2000 EU water Framework Directive, which requires all EU waters to achieve 'good chemical and ecological status'. To meet these challenges, and given the geographical conditions, a joint programme between the countries responsible for the quality of the river was put in place. To improve the quality of the river the First Danube River Basin Management Plan, published in 2009, identified measures to be implemented by 2015.

The first two survey campaigns, JDS1 and JDS2, were essential to identify the main sources of problems and to select the right measures to solve them. As some measures were already put in place, JDS3 served to monitor their effectiveness. The results will feed directly into the next Danube River Basin Manage-

ment Plan and the Joint Programme of Measures to be adopted at the end of 2015.

The JSD3 was coordinated by the ICPDR, and used three boats which sailed along the river through ten countries. From a scientific perspective the initiative is remarkable as it covered water, sediments and biological aspects of the river. In addition, the survey used conventional monitoring techniques but also cutting edge methodologies, contributing to the generation of scientific knowledge.

The entire region has benefitted from the creation of a strong network of scientists, private and public laboratories universities and research institutions. Above all, the JDS3 is a model for cooperation: the JSD3 took place during the International Year of Water Cooperation and thus showed that scientists can collaborate in order to study, analyse and propose practical solutions to water pollution problems created by different stakeholders in a coordinated manner.

Blanca Jimenez Cisneros,
Director of the Division of Water Sciences and Secretary of the International Hydrological Programme of UNESCO



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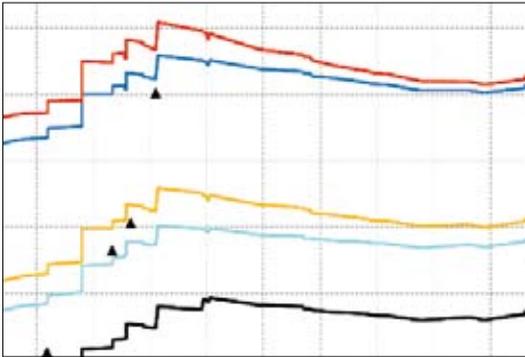
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MANAGING THE DANUBE UNTIL 2021: HAVE A SAY!

The public consultation for the Danube River Basin Management Plan Update 2015 and the first Flood Risk Management Plan is under way. Drafts of the two plans were published for comments on ICPDR.org in December last year. In May, when further details will be available, a social media campaign will encourage comments and a film clip, under production, will explain the importance of the public's role. However, the highlight of these consultation efforts will be a stakeholder consultation workshop, which will take place in Zagreb, Croatia, on 2 and 3 July.

Stay updated at: www.icpdr.org/main/activities-projects/consultation-2015



CLIMATE CHANGE ADAPTATION STRATEGY FOR RHINE BASIN

The International Commission for the Protection of the Rhine has published a climate change adaptation strategy for the Rhine River Basin district. The development of this strategy is based on a sound evaluation of scientific studies, a process that started as early as 2007. Addressing an expected precipitation increase of 20% in winter and a decrease of 10% in summer, the adaptation strategy also had to take regional variability into account. Projections are divided into 'near future' until 2050 and 'distant future' until 2100.

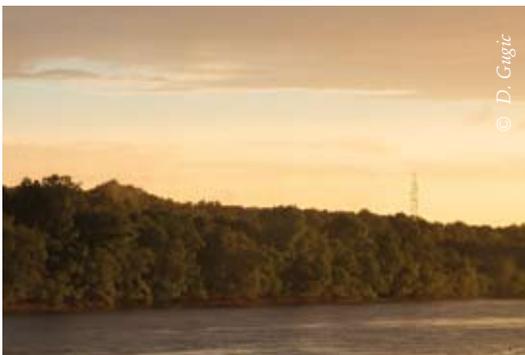
Download the strategy at: www.iksr.org



APPLY NOW FOR THE IRF EUROPEAN RIVERPRIZE

The International RiverFoundation is calling for applications for the 2015 IRF European Riverprize, an esteemed award for the restoration, protection or sustainable management of European rivers and wetlands. Any organisation or partnership can apply, regardless of the size of the river or the scale of the work. The winner will automatically qualify for the Thies International Riverprize in 2016. Applications can be made on the IRF website, and the first stage of the application process must be completed by 29 May 2015.

Learn more here: www.riverfoundation.org.au/riverprize_european.php



SAVAPARKS: NETWORK OF WETLANDS ESTABLISHED

Fifteen institutions and organisations from Slovenia, Croatia, Bosnia and Herzegovina and Serbia signed the SAVAPARKS Declaration on the occasion of World Wetlands Day, establishing a network of wetlands and protected areas. The network will develop guiding principles on nature conservation, river and floodplain rehabilitation and sustainable use of water in the Sava River Basin. SAVAPARKS links a significant variety of the basin's unique natural and cultural heritage features of the Sava River Basin, which is a tributary of the Danube.



FOURTH IMPLEMENTATION REPORT ON THE WATER FRAMEWORK DIRECTIVE AND FLOODS DIRECTIVE

On 9 March, the European Commission published an interim report to the European Parliament and Council on the implementation of the EU Water Framework Directive. The report includes a review of progress on the Programmes of Measures planned by Member States in their river basin management plans. The report is based on analysis of the reports submitted by Member States and also suggests improvements to future programmes of measures for update of the river basin management plans. To identify and build on existing synergies with the Floods Directive, the report also includes an assessment of that Directive's implementation.

Download the report and supplementary information at: http://ec.europa.eu/environment/water/water-framework/impl_reports.htm#fourth

NEW HEADS OF DELEGATIONS TO THE ICPDR

The ICPDR welcomes new heads of delegations. For Croatia, Mr. Ivica Plišić takes over from Mr Dražen Kurečić, who is presiding over the ICPDR in 2015 (see interview page 24); for Ukraine, Mr Mykhailo Tomakhin takes over from Mr. Mykola Melenskyi. Danube Watch thanks the outgoing heads of delegations for their support and is looking forward to working with their successors.

NEW FINANCIAL MANAGEMENT OFFICER IN ICPDR SECRETARIAT

The ICPDR Secretariat has a new staff member: as Financial Management Officer, Ms Joanna Blaszkiwicz will support the sound and efficient use of the commission's resources. The Polish accounting specialist will add a wealth of experience to the Secretariat, derived from an international career in different industries with a strong regional focus on Central and South-East Europe. Until recently, Ms Anna Koch was in charge with the ICPDR's financial administration, assisted by Ms Conny Gehringer, they have both left the ICPDR Secretariat. Danube Watch wishes Ms Blaszkiwicz all the best for her new tasks and thanks Ms Koch and Ms Gehringer for their services.



Destilliertes Wasser
Distilled water
Eau distillée
Agua destilada
H₂O
CAS No. 7732-18-5

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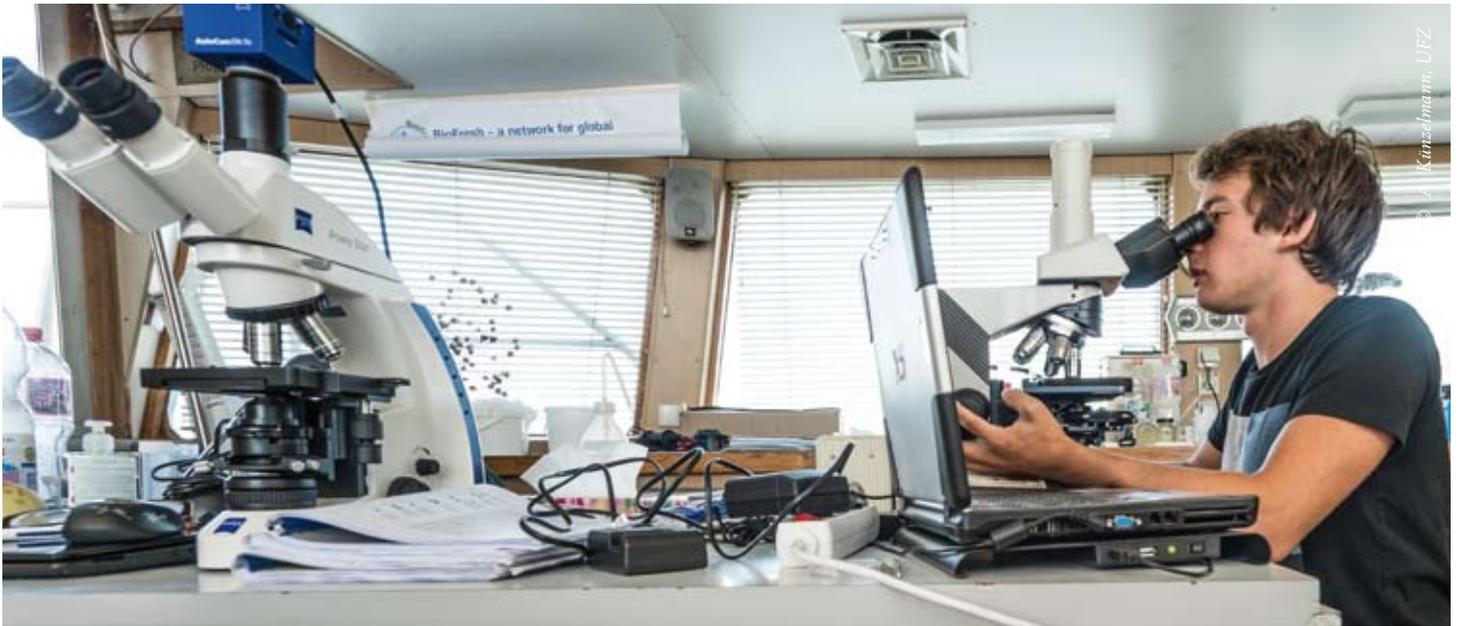
Conclusions from the Danube's largest river research expedition

Results from the Joint Danube Survey 3 have been released, providing crucial information about the basin to improve understanding and decision-making, and to influence the next Danube River Basin Management Plan due later this year.





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That core team of 20 scientists was responsible for taking and processing samples as well as making all on-board analyses, while JDS3 national coordinators facilitated organisation at the national level, especially administrative issues and local logistics.

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The Joint Danube Survey 3 (JDS3) produced the largest volume of knowledge on the Danube River Basin ever collected in a single experience. Although the survey itself was completed in six weeks, analysing such a large amount of data took much longer. The results have recently been released and present a portrait of the entire river. While work is still needed to address some problems, the results of the JDS3 prove that the waters of the Danube are becoming healthier and safer for all.

An international team of 20 scientists collected samples at 68 sites, spending about three hours on each site. Scientists conducted tests looking for chemical and hazardous substances, as well as for animals and plants – from larger shellfish to microscopic bacteria. They also monitored parameters such as temperature, dissolved oxygen and pH, as well as a hundreds of chemical substances. To study hydromorphological characteristics, the team tested sediment, measured water velocity, took photographs and created inventories of harbours, sand bars and gravel banks.

The data and information gathered during the survey was organised into three interrelated assessments of the river – biological, chemical and hydromorphological – to determine if the status of waters had improved or deteriorated.

An encouraging biological assessment. The biological assessment included assessments for each ‘biological quality element’ as classified under the EU Water Framework Directive (WFD): macroinvertebrates, macrophytes, phytobenthos, phytoplankton, fish, zooplankton, invasive alien species and microbiology.

The Danube’s impressive biodiversity was reconfirmed by the JDS3. Fish numbers, in particular, were remarkable, with over 139,000 individual fish and 67 species sampled. Even with these results, however, 50–90% of the sites monitored did not meet WFD requirements for fish, because of pressures such as hydropower and poaching. In addition, invasive alien species were shown to be increasing, significantly affecting native species.

Chemical assessment shows improvement. Results of the JDS3 seem to show that improvements to municipal wastewater treatment have had a positive impact. Levels of nutrient pollution, especially nitrogen and phosphorus, have declined since the last JDS.

Priority substances as identified by the WFD were generally found to be below levels of concern, although some priority substances exceeded these levels. Concentrations at 94% of sites exceeded WFD levels of perfluorooctanesulfonic acid, a new priority substance that repels water and oil and is resistant to heat and chemical stress. WFD levels were also exceeded at some sites for polycyclic aromatic hydrocarbons (found in oil, coal and tar deposits as by-products of incomplete combustion processes) and tributyl-tin (used in antifouling paint on ships to prevent the growth of organisms). Furthermore, mercury concentrations in all fish samples exceeded acceptable levels.

A large number of emerging polar organic substances were found but they were at very small concentrations; for most of the contaminants the concentrations were lower than the JDS 2 in 2007. Analysing such a large amount of organic substances enabled experts to provide suggestions for the update and prioritisation of the Danube River Basin specific pollutants.

Sustainable restoration needed. Good ‘hydromorphology’ – or the physical characteristics of the shape, boundaries and content of a water body – is an important requirement of the WFD to provide natural species with the conditions needed to thrive, such as migration routes and healthy habitats.

The results of this hydromorphological assessment were similar to those of the JDS2. No stretches of the river are near natural conditions: 60% of the entire Danube is slightly or modified and the remaining 40% is severely modified. The Upper Danube is generally poor, with 75% intensely altered. About 63% of the Middle Danube is good or moderate. The Lower Danube, however, is generally good and includes the river’s longest free-flowing stretch of 860 km.

Building on past surveys. The JDS has been carried out every six years – JDS1 was held in 2001 and JDS2 in 2007. Those earlier surveys provided essential information to help identify the main issues in the region and their causes, and helped Danube and European decision-makers to select the right measures to solve problems. JDS1 found high levels of biodiversity and rare species, though negative results included organic and microbiological pollution, heavy metals, oil from ships, pesticides and chemicals. JDS2 confirmed that cooperation among Danube countries had brought positive results, with progress made in many areas – especially water quality – since the first survey.

The JDS3 followed up on this past work to identify how measures already put in place have affected the status of waters, and at the same time, the JDS3 introduced new tests and methods to address advances in technology and emerging issues – such as invasive alien species or hazardous substances. The results of the JDS3 are already being incorporated into the next Danube River Basin Management Plan and the Joint Programme of Measures to be adopted at the end of 2015.

Since 2001, the Joint Danube Surveys have accumulated crucial scientific information about the basin to improve understanding and decision making. The surveys have discovered new species and produced a database of over 10,000 photos of the river’s structures. New techniques and technologies have been tested for the first time – many of which could improve the work of scientists across the globe.

Explore the articles on the next few pages for more information about the JDS3, and visit www.danubesurvey.org for details on the findings.

Kirstie Shepherd is a freelance journalist living in Vienna and has called the Danube River Basin home since 2000.



Microorganisms are a key component for the assessment of water quality in rivers. Microbes, especially bacteria, provide many ecosystem services such as breaking down organic matter in the water, carbon storage and nutrient cycling. However, faecal pollution and microbiological contamination have a negative impact on the many ways that we use and rely on water resources, including for drinking water, recreation and industrial applications.

Though so important, microorganisms haven't received enough attention in the EU Water Framework Directive. So in order to advance knowledge in this underrepresented field, a comprehensive programme covering both aspects of microbiological water quality was a central objective of the Joint Danube Survey 3 (JDS3).

Mapping pollution. Microbial faecal pollution is a significant health hazard as it can contain bacterial, viral and protozoan pathogens from humans or animals. As part of the JDS3, experts created a detailed microbial water quality map of the Danube, along with 16 tributaries and branches, to identify microbial faecal pollution hotspots. Standard faecal indicator bacteria like *Escherichia coli* and intestinal enterococci are used worldwide for faecal pollution monitoring since they sensitively detect the presence of faecal contamination.

Out of 186 samples taken, 34 were classified as critically polluted, five as strongly polluted and three as excessively polluted. The Arges tributary in Romania and the Russenski Lom branch in Bulgaria were identified as hotspots of excessive pollution. The hotspots of faecal pollution in

the Danube were the stretch between Novi Sad and downstream Belgrade in Serbia, downstream Budapest and Dunaföldvár in Hungary, and downstream Zimnicea and Arges in Romania. The site with the highest contamination in the Danube was found in the upper reaches in Kelheim, Germany, downstream of the Rhine–Main–Danube canal, a section with little to moderate pollution generally and state-of-the-art wastewater treatment – a surprise for the JDS3 scientists, for which no definite explanation has been found so far.

However, the results of the JDS3 should be considered a snapshot analysis of microbial faecal pollution. While the data reveals general trends along the Danube, a more detailed analysis is necessary before making definitive site-specific statements. In contrast to the microbiological sampling

Microorganisms have huge significance for the Danube River

The river and its tributaries receive wastewater from urban areas as well as farms and pastures and microbiological contamination is an issue that deserves attention throughout the Danube River Basin. To study the extent and the origins of this pollution, the Joint Danube Survey 3 included a comprehensive programme to investigate the microbiological water quality.



The Joint Danube Survey 3 included microbiological studies focused on assessing the levels and sources of bacteria, as well as bacterial characteristics, such as their resistance to pharmaceutical drugs.

of the JDS1 and JDS2, samples were taken not only from the middle of the Danube but also at the left and right river banks. Results of the previous surveys indicated that the water in the middle of the river was often unaffected by high concentrations of microbial faecal indicator bacteria entering the Danube from wastewater treatment plants or polluted tributaries.

Tracing microbes to the source. Determining the amount of faecal pollution is important, but knowing its origin is crucial for water management. Determining the sources responsible for pollution is necessary to develop effective measures to counteract the pollution. Microbial source tracking methods can provide the critical information experts need to identify whether the contamination is human or animal in origin.

A new set of genetic faecal markers were applied for microbial source tracking as part of the JDS3. Using this marker set, experts determined that the microbial faecal pollution in the Danube is predominantly human, with animal sources – such as pigs or cattle – playing only a minor role.

Studying self-purification processes.

Aside from bacteria, the microbial content is made up of viruses and protozoa. Together these microorganisms provide an important natural service by breaking down organic material in the water, which is often considered to be ‘self-purification’. The bacterial biomass that is built up is consumed to a large extent by protozoa, which themselves are consumed by metazoa (mainly fish and zooplankton), representing an important nutritional source for the entire river ecosystem.

The JDS3 presented the first opportunity to formulate basic hypotheses on self-purification processes and on the development of the natural micro-flora along the whole river. Intriguing results showed that the bacterial community collected in the middle of the Danube was progressively unaffected by external sources, such as wastewater or tributaries, with the increasing width of the river. For example, despite the many purified and un-purified wastewater inputs, the bacterial community in the middle of the river was progressively dominated by small coccoid cells. This may be an adaptation to increasing nutrient deprivation.

The results from the microbiology programme of the JDS3 should prove to be very significant for the Danube River Basin and the water management administrations of the Danube countries. Hopefully, the new insights will serve as a valuable basis for the sustainable management of the microbial water quality of the Danube, and will stimulate more profound and detailed studies in the future.

Alexander Kirschner, of the Medical University Vienna, and *Andreas Farnleitner*, of the Vienna University of Technology, were leaders of this project in the framework of the Inter-university Cooperation Centre for Water & Health.

Putting new methods to use for the Danube

The Joint Danube Survey introduced several unique approaches resulting in a big step toward identifying Danube River Basin specific pollutants needed to fulfil the EU Water Framework Directive.





A specific focus in the Joint Danube Survey 3 (JDS3) was the identification and prioritisation of Danube River Basin Specific Pollutants (RBSPs) in support of the revision of the Danube River Basin District Management Plan in 2015. The EU Water Framework Directive requires environmental quality standards for each RBSP relevant at the basin level. The substance must also be regularly monitored and a plan targeting it included in the programme of measures.

Several unique approaches were applied for the first time as part of the JDS3, including techniques of solid phase extraction to sample large volumes (500–1000 litres) of water, passive sampling to allow for the detection of highly diluted pollutants as well as the screening of non-target contaminants within the entire river basin. These techniques are contributing to the recent developments in the network of reference laboratories, research centres and related organisations for monitoring of emerging environmental substances (NORMAN network), where the JDS3 dataset is used as a model example for detecting very wide range of substances at a large river basin scale and archiving the raw full-scan mass chromatograms for retrospective screening of emerging pollutants.

Large volume sampling. Several techniques were used to tackle the “pollution dilution” problem of spot sampling in large rivers. Toxicological effect-based screening requires the extraction of large volumes of water to provide samples for a variety of bioassays and multi-target chemical analyses. At the same time, transporting and preparing extracts of hundreds of litres of water is a big challenge. A newly developed mobile large volume solid phase extraction device (LVSPE) was used to extract water samples of up to 1000 litres during the survey.

This technique was successfully applied at 22 sites to realise effect-based screening on a river basin scale. The chemical screening resulted in the detection of 91 compounds (out of 264 targeted compounds) in at least one sample. Relatively high concentrations were found of pharmaceuticals, artificial sweeteners, corrosion inhibitors and industrial chemicals, and concentrations of widely used herbicides were also

frequently detected. The samples were analysed with a battery of 11 bioassays to assess the toxic effects of compounds (and their mixtures) present in the samples.

Passive sampling. In addition, the survey ship was equipped with an ‘active’ passive sampler system to screen for trace organic pollutants and their toxic potentials. Three types of passive samplers were installed to capture a wide range of compounds with different physico-chemical properties. During the sampling, the laboratory survey ship moved downstream along a defined stretch and collected samples containing pollutants integrated in time and space along that stretch. Samplers were exchanged every four to six days to cover the pre-defined river stretches.

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Effect-based screening could be an important prerequisite for a holistic and risk-based river basin management to support the EU Water Framework Directive.
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Despite the low concentrations of most organic pollutants present in the samples, passive sampling enables the clear identification of spatial gradients of a broad range of organic pollutants in the water column, including polychlorinated biphenyls, organochlorine compounds, polyaromatic hydrocarbons, alkylphenols, selected polar pesticides and pharmaceuticals. Passive sampling made it possible to detect some compounds at low concentration levels that were not attainable with other methods in the JDS3. In most cases, passive samplers confirmed a similar distribution of pollutants along the river as observed in the JDS2.

Non-target screening. Chemical pollution has largely unknown effects on aquatic life and human health. To ensure that all contaminants are detected requires a non-targeted approach. During the JDS3, state-of-the-art liquid and gas chromatography-mass spectrometry (LC-MS, GC-MS) techniques in three different laboratories were used for non-target screening of all JDS3 samples – with the goal to search for as many compounds as possible while focusing on compounds not previously known to be present in the Danube River and its tributaries.

Initial results from non-target screening revealed the presence of more than 3370

different organic compounds in the Danube water samples. The follow-up evaluations resulted in the identification of 56 additional substances, mostly pesticides, pharmaceuticals and personal care products. The remaining suspect or unknown compounds still need to be investigated. The statistical analysis of data has clearly pointed out significantly differing pollution patterns of thousands of detected compounds for the river stretches and countries within the basin.

Prioritisation. Out of a list of hundreds of target pollutants, 20 substances were preliminarily considered of basin-wide relevance, which all exceeded the ecotoxicological threshold value at one or more sampling sites. In fact, 16 of the 20 substances were found at more than 20 of the 68 sites sampled. Of these 20 substances, five are priority substances as defined by the EU Water Framework Directive (three polycyclic aromatic hydrocarbons, fluoranthene and PFOS (polyfluorinated substance)) and two candidate compounds on the EU Watch List (17beta-estradiol and diclofenac). The top ten substances were dominated by: the pesticides 2,4-dinitrophenol (exceeding the limit at all sites), chloroxuron, bromacil, dimefuron and diazinon; transformation products of widely used atrazine and terbuthylazine; PFOS; and the plasticiser bisphenol A and polyaromatic hydrocarbon benzo(g,h,i)perylene.

For more information about the results of the JDS3, visit danubesurvey.org for the JDS3 Final Scientific Report.

Jaroslav Slobodnik is an expert at the Environmental Institute, Kos, Slovak Republic.



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Many samples were tested on board the ships, while others were shipped to participating laboratories throughout Europe. Leading laboratories across Europe carried out chemical analyses, and corporate partners, such as the Coca-Cola System and Donauchemie, supported the JDS3 through financial contributions and by sharing their knowledge about water management from the private sector perspective.



Riparian bird species as indicators for river dynamics and morphology



More than 81% of all territories for the Little Ringed Plover were found on banks and islands.

River dynamics and natural morphological processes are the key for long-term preservation of the Danube River ecosystem and determine the great habitat variety and species richness. Within the ICPDR Joint Danube Survey, DANUBEPARKS began to monitor of two indicator species to describe the situation of river morphology on a Danube-wide scale.



The Little Ringed Plover and Sand Martin are both closely linked with river dynamic habitats. Once abundant along the Danube, these bird species have begun to disappear from their natural environment because of human impact: regulations of meanders and side arms, embankments and dams have changed the healthy status of river habitats.

Dynamic islands, priority to conserve the Little Ringed Plover. The Little Ringed Plover needs bare or sparsely vegetated gravel or sand banks, laying its brilliantly disguised eggs on blank sediments. In

2013, a total of 182 territories of Little Ringed Plover were recorded. Mainly because of the different water level conditions, the numbers differ strongly from the results of the 2011 survey, where 369 territories were observed. The results
Rivers can realise their biological potential only when natural or no more than slightly modified.

stress the outstanding natural value of the Middle and the Lower Danube. Owing to hydromorphological alterations, the Upper Danube shows the lowest density of Little

Ringed Plover; only the last free flowing sections indicate the high potential for and the relevance of river restoration. More than 81% of all Little Ringed Plover territories were found on banks and islands, which are hotspots for characteristic river species.

Spectacular Sand Martin colonies, endangered by river regulation. The Sand Martin burrows its nests into steep natural river banks; breeding colonies indicate sites where natural lateral erosion is still active. In 2013, 103 colonies with a total of 10,453 breeding pairs of Sand Martin could be located along the Danube. (2011: 82 colonies with 22,817 pairs.) Sites such as Deliblato Sands Special Nature Reserve in Serbia with the largest colonies of up to 16,000 bird individuals offer impressive nature experiences, however all colonies along the Danube should be focal points of conservation and priority subjects of protection.

River dynamics contribute to good ecological status. Statistical models showed the significant correlation between intact hydromorphology and the presence of indicator species: in slightly modified river sections (hydromorphology class 2), the probability of the occurrence of one of the two species is about 89% per 10 river kilometres; in class I (near-natural reference condition; extinct along the Danube) the indicator bird species could even be expected with a probability of about 97%. Stronger hydromorphological alterations greatly decrease the occurrence of species to 30% in sections with class 4 (extensively modified). Consequently, rivers can realise their biological potential only when natural or no more than slightly modified.

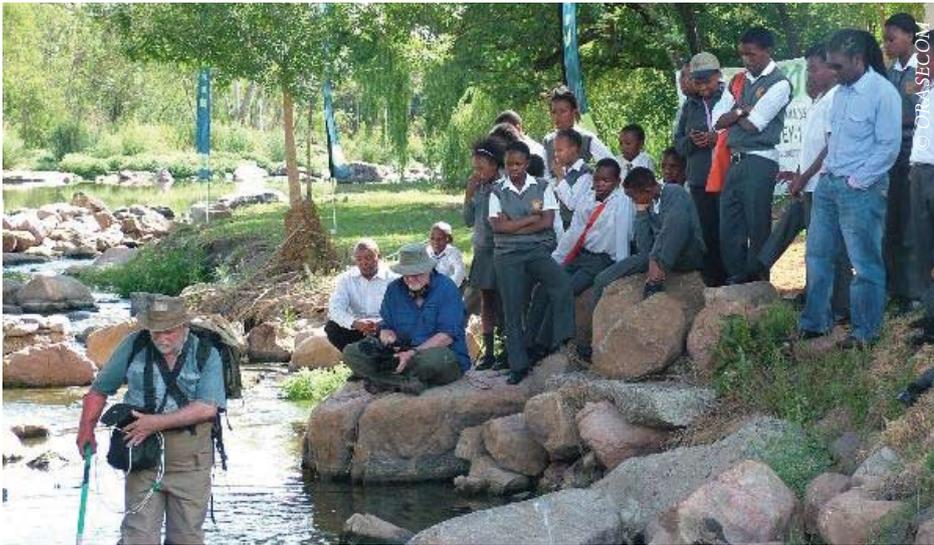
River dynamics goes public. The scientific monitoring was shared with the public through school events, river wilderness excursions and topic presentations: the Little Ringed Plover and Sand Martin fascinated many people and continued to raise awareness for natural river morphology along the Danube.

Georg Frank is the Secretary General of the DANUBEPARKS Network.

Matthias Schmidt, BirdLife Austria, is the scientific coordinator of the DANUBEPARKS monitoring of indicator bird species.

The Danube inspires a river survey in southern Africa

A second Joint Basin Survey is being launched in the Orange-Senqu River Basin in southern Africa this year, based on a relationship between the ICPDR and the Orange-Senqu River Commission and inspired by the Joint Danube Surveys.



The ICPDR's Joint Danube Survey is one of the world's largest river surveys, and its influence has been felt outside the region. The Orange-Senqu River Commission (ORASECOM) is currently organising a similar river survey, based on collaboration with the ICPDR.

The relationship between ORASECOM and the ICPDR has been one of collaboration, cooperation and knowledge sharing since the two commissions established a long-term association in 2008. After its first visit to the ICPDR, ORASECOM began planning its first Joint Basin Survey (JBS), inspired by the ICPDR's experience. At that time, the ICPDR had already conducted two Joint Danube Surveys, and discussions provided the seed of an idea to undertake a similar survey of the Orange-Senqu system.

The first Joint Orange-Senqu River Basin-wide Water Resources Quality Survey (JBS1) was conducted from September to November 2010 to establish the baseline conditions against which ORASECOM could measure progress with regard to wa-

ter resources quality throughout the basin. The ICPDR lent support and expertise to that survey and has expressed willingness to be part of the next survey, illustrating the strong relationship between the two commissions.

Building on experience. ORASECOM decided to conduct the surveys every five years, and the second (JBS2) is planned for 2015, based on lessons learnt from JBS 1. The goal of JBS2 is to contribute towards the achievement of the Commission's mandate of technically advising the parties on matters relating to the development, utilisation and conservation of the water resources in the river system as well as establishing standardised forms of collecting, processing and disseminating data.

Following this goal, the development objective of JBS 2 is to determine the current state of the quality of the water resources within the Orange-Senqu River System and to measure progress and establish potential ecological trends since the JBS1, during which an ecological baseline was established.

A sampling programme will be drawn based on the conditions established during JBS1, and additional monitoring data between 2010 and 2015 will be used to assess trends in aquatic ecosystem health, chemical and microbial water quality, and survey persistent organic pollutants, polycyclic aromatic hydrocarbons (PAHs), heavy metals and other compounds of concern in the Orange-Senqu River Basin.

The JBS2 and future surveys will benefit ORASECOM and the countries sharing the river basin, water resource managers and the water users in the region and ultimately the public who rely on the river and its ecosystems.

Lenka Thamae is the Executive Secretary of the Orange-Senqu River Commission.

Public events were held as part of the JBS1 to help build awareness of the importance of maintaining river health. School children were among those involved, with the hope that they would continue to monitor and provide information to ORASECOM after the survey.

THE ORANGE-SENQU RIVER COMMISSION

The Orange-Senqu River Commission (ORASECOM) was one of the first of the joint basin commissions to be established under the revised Southern African Development Community Protocol on Shared Watercourses, and the Commission promotes the equitable and sustainable development of the resources of the Orange-Senqu River.

The Orange-Senqu River Basin is the third largest in southern Africa, after the Zambezi and the Congo, and covers a total area of 1,000,000 km². Four countries – Botswana, Lesotho, Namibia and South Africa – share the Basin, and the river forms the border between South Africa and Namibia in its lower reaches. The effective management of the Orange-Senqu River Basin is, therefore, particularly complex, but is also vital to the economy of the region.



While there is a general perception that small hydropower is environmentally friendly, this is not always the case. Hydropower projects may be planned in ecologically sensitive areas where they could harm the habitats. Under certain circumstances, they may also negatively affect clean water, fisheries and tourism.

Across the Danube River Basin, WWF has been supporting civil society to stop some unsustainable hydropower projects in the Tyrolean Alps in Austria, Natura 2000 sites along the Bulgarian tributaries of the Danube and in the Romanian and Ukrainian Carpathians.

Relying on the ICPDR Guiding Principles on Sustainable Hydropower Development in the Danube Basin, citizens in Romania and Ukraine have successfully barred some

small hydropower from excessive state aid. Meanwhile, activists in Austria and Bulgaria have gathered thousands of signatures in their river protection efforts.

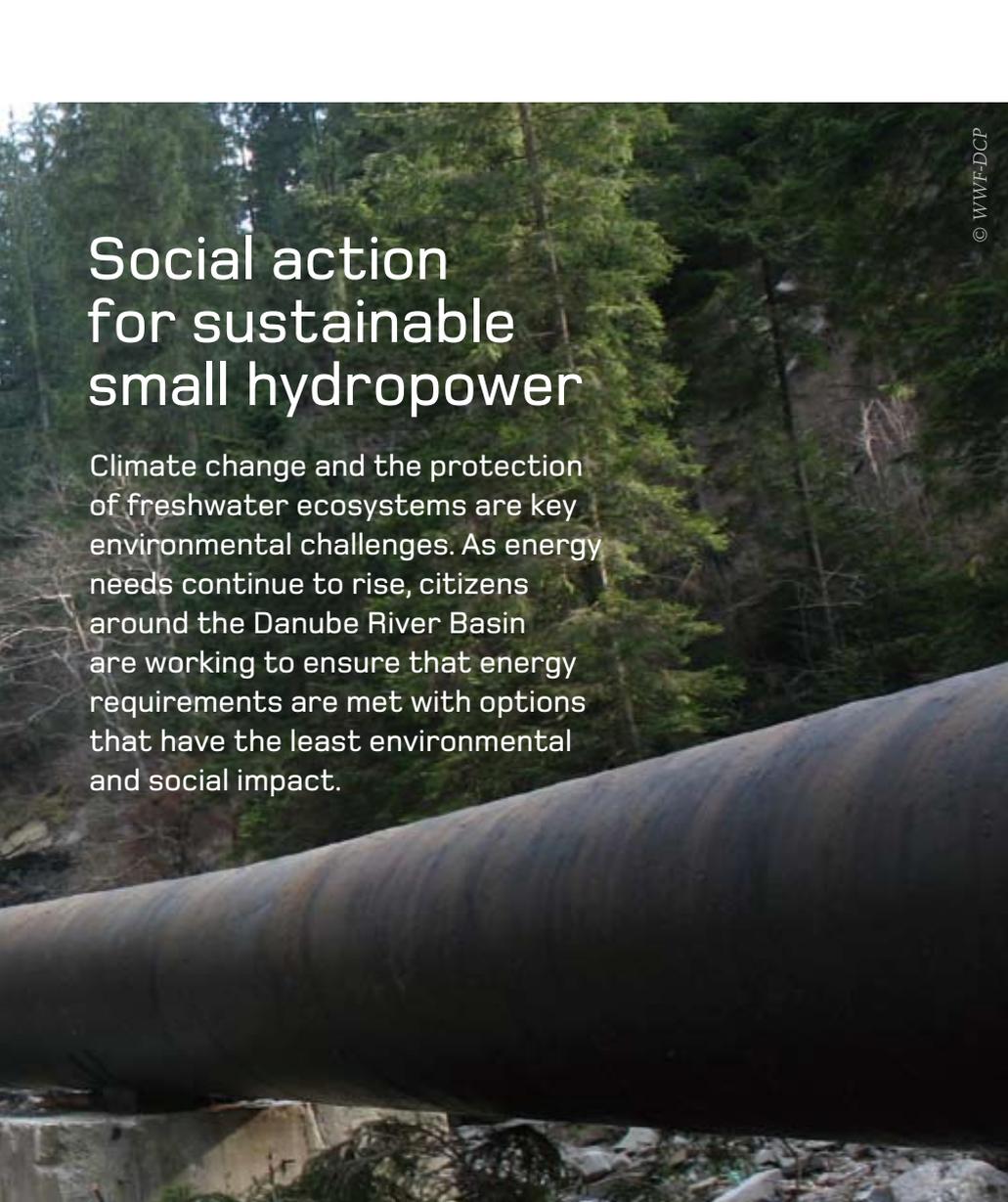
Apart from initiating public debate on river issues, these efforts seek to increase compliance with existing river basin management plans that in fact already forbid hydropower construction in water protection areas.

‘No-go’ areas in Romania. In Romania, small hydropower projects will be excluded from EU funding until 2020. The country’s new partnership agreement with the European Commission does not envision subsidies for these projects under the Operational Programme Large Infrastructure. Romanian authorities also promised to assign ‘no-go’ areas for areas protected from small hydropower development. Authori-

ties temporarily suspended existing hydropower construction permits as well, and created a joint working group of government and civil society to develop criteria for integrating ‘no-go’ areas into legislation and improving construction and operation conditions for hydropower outside those designated areas.

The success in Romania followed a nationwide action in 2013 that united associations of fishermen, researchers, academics and ecotourism groups. A petition against some small hydropower projects gathered 20,000 signatures from nature lovers too.

Bringing environmental risks to court in Ukraine. In August 2014, the Ukrainian parliament adopted a law that abolishes tax breaks for small renewable energy producers. Low taxes and high ‘green’ tariffs had long helped some businesses make serious



Social action for sustainable small hydropower

Climate change and the protection of freshwater ecosystems are key environmental challenges. As energy needs continue to rise, citizens around the Danube River Basin are working to ensure that energy requirements are met with options that have the least environmental and social impact.

profit even after paying fines for violating environmental regulations in protected areas and intact rivers. Meanwhile, the Lviv Regional Administrative Appeal Court also declared the plans to construct 360 small hydropower plants in the Zakarpattia Region illegal.

The lawsuit against the plants had been initiated by active citizens supported by NGOs and the Ministry of Regional Development, Construction, Housing and Utilities of Ukraine, among others. In fact, this was the first time activists have managed to overturn a regional council decision in two court instances. Besides the 360 plants in the Zakarpattia Region, the regional self-governance body of the Ivano-Frankivsk Region declared an additional 150 plants without proper environmental impact assessment unacceptable. The decision is not binding for hydropower operators, but

expresses the will of the local governance body.

As far as small hydropower is one of the solutions to Ukraine's energy problems in the wake of potential gas and electricity shortages, preparations for new hydropower plants are again under way in three regions in Ukraine, including the Zakarpattia and Ivano-Frankivsk regions. It is worth mentioning that taking into account the need of compliance of the Ukrainian legislation to EU Directives on EIA and SEA, stated in Annex XXX of the Ukraine-EU Agreement, there is a strong belief that new small hydropower stations to be built will have minimal environmental effect, supporting the country's independence in the field of energy at the same time.

Building a database of projects in Bulgaria. Since its launch in August 2014, the

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Responding to a lawsuit brought by dedicated citizens, an appeals court in Ukraine declared plans to construct 360 small hydropower plants illegal.

WWF petition to protect Bulgaria's last free-flowing rivers has gathered thousands of signatures. An online GIS platform maps the country's rivers, water bodies and water protection areas and shows the extent to which ecosystems are harmed by small hydropower plants. The map also presents all existing and planned hydropower plants and the stage of their development.

The GIS platform is a good tool to check plans and current construction of hydropower projects. Fishing clubs in Bulgaria have already used it to build their own small hydropower database. Apart from initiating public debate on river issues, these efforts seek to increase compliance with existing river basin management plans that in fact already forbid hydropower construction in water protection areas.

Discussing expansion with all stakeholders in Austria. Aside from small hydropower projects, environmental organisations in Austria continue to fight against the planned expansion of the Kaunertal hydropower plant and six other large plants in the Tyrolean Alps. The petition against Kaunertal has gathered 20,000 signatures so far, and NGOs and citizens recently presented the document to the Austrian federal minister responsible for environment and water.

A comprehensive round table with all stakeholders was set up to determine how to proceed with hydropower expansion. While NGOs do not fundamentally oppose expansion, they reject plans that affect pristine rivers and intact habitats, as in the Kaunertal case.

Konstantin Ivanov is Regional Head of Communications of the WWF Danube-Carpathian Programme.

For three years, a stakeholder forum reviewed progress on a project to revitalise shorelines and stabilise the deepening river bed over a stretch of nearly three kilometres downstream of Vienna.

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Building trust between stakeholders

To find a balance between navigational and environmental interests, project organisers created a stakeholder forum to provide a fact-based and constructive dialogue on a level playing field.

Finding a balance between stakeholder interests is difficult when those interests seem at odds with one another. But in 2011, when Austrian waterway company viadonau proposed testing various measures to revitalise shorelines and stabilise the river bed over a stretch of nearly 3 kilometres in the national park downstream of Vienna, the World Wildlife Fund (WWF) suggested accompanying these tests with an open dialogue in a stakeholder forum. Harald Pilz and Andrea Trumler, senior consultants at denkstatt, a European consulting company for sustainability issues, were brought in to moderate the dialogue. Pilz speaks to Danube Watch about building mutual understanding between stakeholders.

Danube Watch: When the Stakeholder Forum began three years ago, you were facing hardened positions especially among environmental NGOs. What had gone wrong?

Pilz: Debates about the problems for nature and navigation at the Danube east of Vienna have existed for 20 years or more. When the stakeholder forum started its work in 2012, underlying distrust was still a challenge to overcome. But with time the forum proved to provide a fact-based and constructive dialogue on a level playing field. Questions were answered, information was provided, transparency increased, and recommendations to optimise the test phase were welcome. As a result trust started to grow between the participants.

Danube Watch: Towards the end of the process, it was the navigation representatives that seemed less satisfied than the environmental side. Do you consider the forum a success nonetheless?

Pilz: Mutual understanding of important interests is a factor for success in stakeholder dialogues. In the forum we understood that navigable water depths are a critical factor for economically sustainable navigation. But in the current test section, and also in a previous one, a combination of changes and influences temporarily worsened navigable water depths.

Therefore I can understand that the navigation sector wants to first evaluate the outcomes of the recent tests before new

projects are planned. On the other hand, various measures to improve the environmental situation seemed to work: re-vitalisation of shorelines, environmental optimisation of groynes and the reconnection of an oxbow.

Even if not all of the goals of the test phase were met, all stakeholders and the scientific advisory board underlined that the test enabled a considerable gain of knowledge, which is now needed to solve the remaining challenges at the Danube east of Vienna.

Danube Watch: How will these challenges be addressed in future projects?

Pilz: The stakeholders collected and discussed quite a number of ideas and proposals for future projects. Important issues were, for example, the selection of optimal grain size for stabilising the deepening river bed, the optimal design of groynes, or an integrated bed load management. It is clear that the next project will be based on this knowledge gain, and it will again combine many different measures in an integrated and adaptive approach. Improvement of environmental and nautical conditions will definitely remain coequal goals.

But it was too early to take decisions about concrete elements of the next project. First the outcome of the now completed test has to be evaluated further, and consensus has to be reached among the stakeholders for some future planning parameters. Nevertheless the participants of the forum agreed to a ‘conclusion statement’, which can be downloaded from the forum’s website.

Danube Watch: What was the main reward of the forum?

Pilz: From the viewpoint of neutral moderators we saw a big improvement in the quality and atmosphere of the dialogue. In the end this was also confirmed by an online evaluation survey conducted by viadonau:

97% said that the forum was a suitable instrument to involve stakeholders, 94% agreed that the test phase with its integrative and adaptive approach was valuable, and 92% confirmed the good availability of results and information.

Participants also underlined that future projects should be accompanied by similar dialogue forums, which should continue to aim at win-win solutions for nature and navigation. I personally consider this new cooperative attitude one of the most important achievements. Based on this common understanding it is now important that the next steps be developed quickly to avoid further erosion of the river bed and to raise the water level in the national park.

Danube Watch: How can other public participation processes learn from this example?

Pilz: It seems that such complex issues can only be solved in an open dialogue between experts and affected stakeholders. Several success factors can support such participatory processes: moderation, documentation and process design should come from an external and neutral provider. All relevant stakeholders should be involved with a balanced number of representatives. Well-structured communication ‘at eye level’, oriented to personal appreciation, will support increasing trust and cooperation. And finally the dialogue should start early enough, when even the planning parameters can still be discussed and influenced.

More information on the forum is available in German at: www.donau.bmvit.gv.at/projekte

An English version of the Rules of Procedure for the stakeholder forum can be provided by ICPDR on request.

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"With time the forum proved to provide a fact-based and constructive dialogue on a level playing field. Questions were answered, information was provided, transparency increased, and recommendations to optimise the test phase were welcome. As a result trust started to grow between the participants."
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PILOT PROJECT BAD DEUTSCH-ALTENBURG

The Bad Deutsch-Altenburg pilot project tested measures to revitalise shorelines and stabilise the deepening river bed over a stretch of nearly 3 kilometres in the national park downstream of Vienna to benefit both navigation and the environment. Starting in early 2012, these measures included applying coarse pebbles to the river bed to address erosion; reducing and re-shaping groynes with more attention given to environmental needs; removing rip rap and remodelling the shoreline including vegetation; and reconnecting an oxbow.

To allow stakeholders to contribute to the project, a stakeholder forum was set up, compris-

ing four representatives of environmental organisations, four from the navigation sector, one from the national park and one from the ICPDR. The forum also had a scientific advisory board and was open to observers.

For three years, the stakeholder forum reviewed the project’s progress and issued recommendations to the project owner, Austrian waterway company viadonau. The stakeholder forum was moderated by consulting company denkstatt (www.denkstatt-group.com). The stakeholder forum has inspired similar efforts elsewhere in the Danube River Basin, such as Serbia.



Regional efforts to restore water quality

Joint cooperation under the EU Strategy for the Danube Region is helping to find common solutions to reduce the negative effect of pressures in the region and protect the waters of the Danube River Basin.

Across the region, 81 million people rely on the waters of the Danube and its tributaries. Such an important shared resource requires shared responsibility, and the countries of the Danube River Basin are working together to protect the river under the EU Strategy for the Danube Region (EUSDR).

The EUSDR addresses the common challenges of the region – encompassing political, social, cultural and economic issues, while balancing concerns for the environment and water quality. One of the 11 priorities of the strategy aims to “restore and maintain the quality of waters” along the Danube River. This priority area (Priority Area 4, quality of waters) is coordinated by Hungary and Slovakia, with manage-

ment shared by the General Directorate for Water Management and the Ministry of Foreign Affairs and Trade of Hungary, together with the Water Section of the Ministry of Environment and the Water Research Institute of the Slovak Republic.

The activities’ list (workplan) of the priority area were formulated in a way that also includes tasks, which are already carried out in the frame of the ICPDR and the International Sava River Basin Commission. For example the development of the river basin management plans and flood management plans in line with the objectives of the EU Water Framework Directive and Flood Directive and activities according to the objectives of the Danube River Protection Convention and Framework Agree-

ment on the Sava River Basin (FASRB) are led by the ICPDR and the International Sava River Basin Commission (ISRBC). To coordinate the joint activities under the EUSDR, the ICPDR and the priority area 4 on water quality (as well as priority area 5 on environmental risks) adopted a Joint Paper on Cooperation and Synergy for EUSDR Implementation in 2014.

Identifying problems and solutions. Four significant water management issues were identified as challenges to achieving good quality of waters in the Danube River Basin: organic and nutrient pollution, hazardous substances and hydromorphological alterations. Measures to reduce the negative effects of these pressures are included in river basin management plans for the region.

The Second Danube River Basin Management Plan will be completed this year, and the Sava River Basin Management Plan and the Integrated Tisza River Basin Management Plan have been prepared for those sub-basins. To implement the measures outlined in these plans, the EUSDR encourages engaging supporting partners such as action leaders, observers, contributors or project partners to establish networks and



platforms. The quality of waters priority area in particular aims to draw on science and innovation to find efficient and novel solutions for gaps and bottlenecks in the implementation of the work plan as well as to coordinate cross-cutting measures with other priority areas.

Focusing on solutions. The quality of waters priority area plays an important role in aligning the development of project proposals with the funding process, and several studies are currently under way to find joint solutions to the challenges in the region. Two studies look at the situation of waste in small, rural settlements. The first study looks at the local relevance of legal provisions on specific waste management activities, as well as the role of municipality councils and the lowest level administrative bodies in regulating, organising and managing local waste management activities. A second study looks at alternative collection and treatment of wastewater, concentrating on the levels of wastewater treatment facilities in small, local settlements, on control by authorities of local wastewater treatment activities and on the kind of legal tools they use.

The EUSDR encourages engaging supporting partners such as action leaders, observers, contributors or project partners to establish networks and platforms.

Further studies are investigating legislation at the appropriate level to limit the presence of phosphates in detergents as well as implementing an early warning system in the Tisza Sub-basin to detect pollution with a transboundary impact. In addition, the priority area, together with the ICPDR, is currently facilitating the development of project proposals for two issues that have specific importance from the water quality priority area point of view: sediment at the Danube Basin level, and a separate project proposal for Tisza River Sub-basin issues. All of these studies and projects will be further developed throughout the next two years, focusing on relevant activities and policies in non-EU countries.

Building transboundary cooperation. In addition to developing and facilitating these projects, the quality of waters priority area emphasis strengthening sub-basin cooperation. The national Tisza Office

was established in Szolnok, Hungary, in November 2014, supported by the Hungarian Danube Region Strategy Ministerial Commissioner as well. In addition to national tasks related to the sub-basin, the Tisza Office will support the ICPDR Tisza Group activities.

One of the first activities organised by the national Tisza Office was the 21st Tisza Group meeting held in Szolnok, Hungary, 26-27 November. At this meeting, which was facilitated by the EUSDR quality of waters priority area, the ICPDR Tisza Group agreed to jointly develop an update of the Tisza Analysis Report as well as the Second Integrated Tisza Basin Management Plan.

More information about these activities and the EUSDR are available on the new web platform of the quality of waters priority area at: www.danubewaterquality.eu.

Diana Heilmann is a member of the Hungarian EUSDR Water Quality priority area. *Andrea Vranovska* is PAC4 SK assistant and the Head of Department of Programmers and Concepts at the Water Research Institute, Bratislava, Slovakia.



ICPDR Presidency 2015 – finding basin-wide harmony through cooperation

Following a ceremonial passing of a bottle with Danube water at the 17th Ordinary Meeting of the ICPDR last December, the Republic of Croatia has taken over the ICPDR Presidency for 2015.

Dražen Kurečić, Assistant Minister of Agriculture for the Republic of Croatia and ICPDR President for 2015, speaks about the challenges of harmonizing national and EU legislation and the value, for individual countries, of working together.

Danube Watch: What are your priorities for the Croatian ICPDR presidency?

Kurečić: In a last couple of decades we have witnessed the severe impact of climate change manifested in frequent occurrence of extreme draughts and floods, not only in the Danube Basin but also in other parts

of Europe and around the world. Floods on the Sava River in May of 2014 caused enormous material damage and loss of human lives in three countries. This event was by all means beyond 'regular' flood scenarios: extreme rainfalls, outstanding water levels (1000-year levels). It clearly confirmed what was stated in the ICPDR Ministerial Meeting Declaration from 2010 that flood prevention and protection are not short term tasks but permanent responsibilities of the highest priority. Therefore, flood issues are a priority for the Croatian ICPDR presidency, as well as finalising two key plans for the next six year period: the Danube River Basin Management Plan and Danube Flood Risk Management Plan.

Danube Watch: When the Danube River Protection Convention was signed in 1994, Germany was the only contracting party that was a member of the European Community – now eight of 14 ICPDR countries are also EU Member States. What has changed for the water sector in Croatia since joining the EU in 2013?

Kurečić: The biggest change has occurred in legislation – harmonising national water management legislation to EU legislation. Croatia had prepared its first river basin management plan before entering the EU. By participating in ICPDR Expert and Task Groups together with experts from both EU Member and non Member States, Croatian experts gained valuable knowledge and experience, which was useful in preparing the national river basin management plan.

However, EU accession also pushed us strongly toward reform of the water-utility sector and Croatia is making great progress in improving the quality of water services and infrastructure. Some of the heaviest financial burden concerns the implementation of the EU Urban Waste Water Directive and the Drinking Water Directive, which require activities such as constructing water utility infrastructure, water supply and sewage systems as well as waste water treatment plants – with investments of 4.5 billion Euros by 2023. Several significant water infrastructure projects are already finished or in progress, financed from national and EU funds.

These activities mean more advanced treatment of waste water and fewer loads for the Danube River, which is vital since the

Republic of Croatia has declared the Danube River Basin a sensitive area. By implementing these directives in all Danube countries we can achieve our common goal of ensuring a good status for the waters in the river basin.

Danube Watch: How do you coordinate your involvement as a member of both the ICPDR and the International Sava River Basin Commission (ISRBC)?

Kurečić: Cooperation with ISRBC and ICPDR is very significant for the Republic of Croatia to preserve both of these important natural resources. The ICPDR is special to us as we appreciate the opportunities we were given through participation in the work of the ICPDR before we were an EU Member State. At the same time, ISRBC – the parties of which are also members of the ICPDR – brings us together with our neighbouring countries and is a unique synergy of water management and navigation issues. The ICPDR provides enough flexibility for ISRBC to act in a more detailed way on a smaller scale.

So far the coordination of activities between these two commissions has been going very well. Experts in the ICPDR Expert and Task Groups are involved in similar activities within the ISRBC preparation of river basin management plans and flood risk management plans, for example. Likewise, the Joint Statement on Guiding Principles for Development of Inland Navigation and Environmental Protection in the Danube River Basin is an excellent example of cooperation between the two commissions, together with the Danube Commission.

Due to the transboundary character of the Danube and Sava Rivers, both the ICPDR and ISRBC are perfect platforms for preparation and coordination at different scales, and there is a benefit for all contracting parties.

Danube Watch: How does ICPDR member-

ship help countries prioritise transboundary water cooperation initiatives when facing times of economic austerity?

Kurečić: It is true that many Danube Basin countries are facing financial and staff shortages due to the economic crisis – the Republic of Croatia is experiencing this as well. It gives us a clear signal that we have to stick together but also to slightly expand our focus from the primary goal of protecting the Danube River to also helping economic growth in the Danube River Basin. Every contracting party has its own reasons for being part of the ICPDR family. Preaccession countries active in ICPDR Expert and Task groups can profit from the knowledge and experience of other EU Member States which have gone through this process before. EU Member States also have clear priorities, which are part of their accession agreements and obligations con-

Dražen Kurečić

1994 – 1999	University of Agriculture, Croatia, Master of Science, Agriculture-Melioration
Jan 2012 – present	Ministry of Agriculture, Republic of Croatia Assistant Minister
Dec 2002 – Jan 2012	Croatian Waters Independent Engineer
Nov 2002 – Dec 2002	Megawat d.o.o. Designer – Head of Marketing
May 2002 – Oct 2002	Migić d.o.o. Designer – Head of Marketing
Sep 2000 – Feb 2002	Brana d.o.o. Probationer Designer
Oct 1999 – July 2000	Megawat d.o.o. Designer – Head of Marketing

cerning EU water legislation, especially the EU Water Framework Directive.

It is undeniable that shared projects are of the utmost importance and that the results of these projects bring basin-wide benefits which could not otherwise be realised. This for me is the true value of being part of the ICPDR family.

The interview was conducted by *Benedikt Mandl*, the Technical Expert for Public Participation and Communication in the ICPDR Secretariat, and the Executive Editor of Danube Watch.



In the Dniester River Basin, joint monitoring activities have built confidence among Ukraine and Moldova, including Transnistria/Moldova.

Governing water – preventing conflicts: the OSCE promotes water governance

Challenges and opportunities related to water remain high on the agenda of the Organization for Security and Cooperation in Europe (OSCE), the world’s largest regional security organisation.

For many years, water has been one of the main areas of OSCE engagement, and 2015 will be a special year for water: The Serbian Chairmanship has made it a priority by dedicating this year’s Economic and Environmental Forum – the organisation’s annual three-part event on select economic and environmental issues that can impact security – to water governance.

The OSCE was founded during the cold war in the early 1970s as a negotiating forum between East and West. Today, the organisation comprises 57 countries on three continents: North America, Europe and Asia. Since its beginnings, the OSCE has followed a comprehensive approach to security that embraces three complementary dimensions: the politico-military dimension, the economic

and environmental dimension and the human dimension. OSCE activities that link environment and security range from water management and hazardous waste to climate change and sustainable energy.

Water and security. When it comes to water, the entry points for the OSCE are clear: first, water is a strategic resource and an essential element of national and regional security. Second, over 150 rivers and lakes are shared by two or more of the OSCE’s 57 participating states.

One transboundary river that is shared by several countries in the OSCE region is the Danube. Here, as in many other watersheds, the riparian countries – all OSCE participating states – have established joint bodies and long-standing and trustful cooperation.

But there are still transboundary basins that lack such agreements, and have insufficient arrangements or no effective implementation mechanism – all of which could potentially lead to disputes.

Supporting water cooperation. The OSCE has a long track record of supporting countries to jointly manage water resources sustainably. The first meeting of the Interim Sava Basin Commission took place at the OSCE premises in Vienna in April 2003, after the riparian countries signed the Framework Agreement on the Sava River Basin, the first development-oriented multilateral agreement signed after the Dayton Peace Agreement.

Eight years of negotiations facilitated by the OSCE and the United Nations Economic Commission for Europe (UNECE) within the Environment and Security Initiative (ENVSEC) culminated in the signing of the Dniester River Basin Treaty by Ukraine and the Republic of Moldova in 2012. The Dniester River Basin is also a focus area of an OSCE-led ENVSEC project on climate change and security, financed by the Instrument for Stability of the European Commission and the Austrian Development Agency.

Since 2003, the OSCE together with UNECE has also supported the establishment and operation of a bilateral water commission of Kazakhstan and Kyrgyzstan on the Chu and Talas Rivers. Since 2010, the OSCE in collaboration with UNECE has facilitated several

rounds of bilateral consultations between Azerbaijan and Georgia for the development of an agreement on the Kura River Basin in the South Caucasus.

In addition to the activities listed above, the OSCE field operations – which are active in Eastern Europe, South-Eastern Europe, the South Caucasus and Central Asia – advance good water governance through training courses on integrated water resources management, giving support to water user associations and river basin councils, and promoting civil society participation.

Researchers, the business community and foreign policy makers are increasingly aware of the risks water crises can pose to security, and the additional stress put on water resources by climate change. Therefore, the Swiss and Serbian OSCE Chairmanships together identified sustainable water management as a priority in their joint 2014-15 work plan. A major event in this context was the Security Day entitled ‘Enhancing security through water diplomacy: the role of the OSCE’ held in Vienna last July by the OSCE Secretary General and the Swiss Chairmanship. The high-level participants emphasised the importance of water diplomacy as a new entry point for foreign policy to foster bilateral and regional cooperation among states.

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Knowing the important role an active and well-informed civil society can play as a partner of the government to reduce environment and security risks, the OSCE has supported the establishment of a network of currently 57 Aarhus centres in 14 countries for over a decade. Among their wide range of activities they play a key role in facilitating participation and access to information on water issues.
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Water scarcity, lack of access to water, and pollution are potential triggers for tensions and conflicts. But water can also be a source of cooperation: jointly managing water can lead to improved relations among countries and communities, and enhance security, prosperity and the protection of the environment. Therefore, water is an essential element of the OSCE's work.
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2015 ECONOMIC AND ENVIRONMENTAL FORUM

Water governance in the OSCE area – increasing security and stability through cooperation

First preparatory meeting, Vienna, 26-27 January. Among others, best practices on the advanced mechanisms for cooperation and participation achieved in the Danube Basin were shared by Susanne Brandstetter, Chair of ICPDR's Public Participation Expert Group, and Dejan Komatina, Secretary of the Sava Commission.

Second preparatory meeting Belgrade, 11-13 May. Focus on awareness-raising and water governance in the context of disaster risk reduction, with discussions on the regional response to the devastating floods that affected South Eastern Europe in May last year.

Concluding meeting, Prague, 14-16 September. Stakeholders will share experiences in meeting water-related risks to security and fostering good water governance.

Looking ahead. The 2015 Forum on water governance (see box) which brings together governments, civil society, international organisations, the private sector and academia, will also look back at disaster risk reduction, the EEF focus of 2014. Clearly, water governance and disaster risk reduction are firmly on the OSCE agenda, linking our work with the ongoing global processes on disaster risk reduction, climate change and the post-2015 sustainable development agenda.

For more information, please visit:
www.osce.org/eea

Desiree Schweitzer is Deputy Coordinator and Head of Environmental Activities in the Office of the Coordinator of OSCE Economic and Environmental Activities.

ICPDR MEETINGS

For final dates, please consult the ICPDR calendar, available at www.icpdr.org.

12-17/4/2015

DAEGU & GYEONGBUK, KOREA

SEVENTH WORLD WATER FORUM

23-24/4/2015

ZAGREB, CROATIA

17TH PUBLIC PARTICIPATION EXPERT GROUP MEETING

23-24/4/2015

PRAGUE, CZECH REPUBLIC

41ST RIVER BASIN MANAGEMENT EXPERT GROUP MEETING

28/4/2015

BUDAPEST, HUNGARY

**EU STRATEGY FOR THE DANUBE REGION,
PRIORITY AREA 5 STEERING GROUP MEETING**

11-13/5/2015

BELGRADE, SERBIA

**23RD OSCE ECONOMIC AND ENVIRONMENTAL FORUM 'WATER
GOVERNANCE IN THE OSCE AREA - INCREASING SECURITY AND
STABILITY THROUGH COOPERATION'**

12-13/5/2015

VENUE TO BE DETERMINED

22ND ICPDR TISZA GROUP MEETING

2-3/6/2015

ZAGREB, CROATIA

13TH ICPDR STANDING WORKING GROUP MEETING

2-3/7/2015

ZAGREB, CROATIA

ICPDR STAKEHOLDER CONSULTATION WORKSHOP**DW 02/15****UPCOMING ISSUE**

Management plans for the Danube River Basin
Danube Day 2015
Innovative projects in the Danube Basin