

DANUBE WATCH

THE MAGAZINE FOR THE DANUBE RIVER · WWW.ICPDR.ORG 3/2018



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ICPDR **IKSD**

International Commission
for the Protection
of the Danube River

Internationale Kommission
zum Schutz der Donau

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Dear readers,

Most of you who work with the Danube or live near the river are probably aware of the fact that a river does not only carry water, but also solid particles called sediment. Sediments can be small particles of clay, silt, sand or coarser gravel. Their movement in the river is quite complex because they can either settle on the riverbed or be suspended and transported by the water. The movement of sediment depends on the water flow, the sediment size, shape, and the type of material it is made up of. As a consequence, sediments play a major role in the development of the structure of the river.

Due to the complex physical background of sediment transport processes in rivers, our knowledge is far from complete. Many problems concerning river management issues are strongly connected to river morphology and the movement of sediment. Let's focus on the Danube River: just think about how flood events can fill floodplains with sediment, or reservoirs with fine sediment deposits, thereby decreasing their water retention capacity; or the problems that low-water levels cause for navigation in the free-flowing sections of the river. All of these sediment-related aspects influence human life and the ecology and economy of the Danube Region.

Despite the direct and indirect links between various water management problems, the ICPDR has not officially declared sediment to be one of the "Significant Water Management Issues" in the Danube River Basin. The

ICPDR has however taken significant steps to reveal the knowledge gaps concerning sediment in the "Danube Basin Analysis Report" of 2004, the "Sediment Issue Paper" in 2006, and the first and second "Danube River Basin Management Plans" in 2009 and 2015. Furthermore, other relevant organisations, such as the SedNet European network, are also working to bring together experts in the field of sediment in order to improve sediment management strategies.

The ongoing DanubeSediment project, which is being implemented within the framework of the Danube Transnational Programme, will also provide a substantial contribution towards basin-wide sediment management. The project will develop the first transnational Danube Sediment Management Guidance (DSMG) containing concrete recommendations and explaining what types of measures can be implemented to improve sediment management. This information will support the ICPDR in developing both the next Danube River Basin Management Plan and Danube Flood Risk Management Plan.

Working on sediment-related issues, we believe that all the efforts made to develop and improve river-wide sediment management, involving researchers, practitioners and relevant stakeholders, will lead to a more sustainable use of the Danube River that will benefit both people and nature alike.

Dr. Péter BAKONYI is Project Director of DanubeSediment and former Chair of the ICPDR Flood Protection Expert Group (FPEG).

ICPDR IKSD

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

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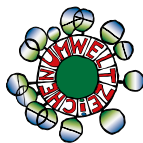
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Danube Watch is the official magazine of the ICPDR, the International Commission for the Protection of the Danube River. Danube Watch enhances regional cooperation and information sharing on sustainable water management and environmental protection in the Danube River Basin. It reports on current issues affecting the Danube Basin, and on action taken to deal with challenges in the river basin. Striving for scientific accuracy while remaining concise, clear and readable, it is produced for the wide range of people who are actively involved in the Danube River Basin and are working to improve its environment.

The ICPDR accepts no responsibility or liability whatsoever with regard to information or opinions of the authors of the articles in this issue.



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News & Events

EU Water Conference 2018

The 5th European Water Conference took place on 20-21 September 2018 in Vienna and was jointly organised by the European Commission's Directorate-General for the Environment and the Austrian EU Presidency. The aim of the conference was to review progress on the implementation of EU water legislation.

Around 400 representatives from EU countries, stakeholder groups from relevant economic, social and environmental sectors, the European Commission, the European Environment Agency and other EU institutions had the opportunity to exchange ideas and experiences concerning the next water planning cycles. The ongoing Fitness Check for the Water Framework Directive, its associated Directives and the Floods Directive, along with the evaluation of the Urban Waste Water Treatment Directive (UWWTD) were also discussed.

The main objective of EU water legislation is to achieve good status of the EU's water resources. On 3 July, the 2018 State of Wa-



ter Report from the European Environment Agency was published. This was followed in November by a new comprehensive assessment of the state of implementation, which included a Commission report on the EU Member States' second River Basin Management Plans and first Flood Risk Management Plans.

Restoring fish migration routes in the Danube River Basin - Feasibility study on Iron Gate dams commissioned to explore joint solutions



The signing of the funding agreement between the ICPDR and DG REGIO will enable the further development of a feasibility study that aims to identify measures to preserve fish stocks on the Romanian-Serbian border.

This action is an important step in the ongoing efforts to achieve one of the central objectives of the EU Strategy for the Danube River: saving the beleaguered Danube sturgeons from extinction. Despite its longevity, this iconic fish is considered to be one of the most endangered species in the world.

The hydroelectric power plants Iron Gates I and II are the largest dams on the Danube River and are jointly managed by Ro-

mania and Serbia. The dams provide vast amounts of sustainable hydropower for the region and also make navigation both easier and safer on the Danube. However, the disruption they cause to the river's continuity constitutes a serious obstacle for migratory fish, including not only the sturgeon species, but also the Danube salmon and the European eel.

Faced with the issues of loss of biodiversity and habitat degradation, stakeholders and international experts have joined together to raise awareness of the need for ambitious fish conservation measures. To this end, the 2020 target for the EU Strategy for the Danube Region, the EU Water Framework Directive, the EU Habitats Directive and the Bern Convention provide a framework for the development of specific conservation measures.

The feasibility study, supported by the European Commission, aims to further harmonise and strengthen these initiatives. The first phase of the study ran from 2011 to 2016 and facilitated dialogue between the ICPDR, relevant stakeholders, and the European Commission (represented by DG REGIO and DG ENV). The project is now entering its second phase. This entails a feasibility study, with a budget of €400,000, which is expected to run until 2020. The third and fourth phases will consolidate technical design and are planned for 2021-2023. Implementation is planned for 2024 onwards.

ICPDR presented with the WWF's highest award



On 12 December 2018 the WWF presented a Gift to the Earth, its highest award, to the ICPDR at a ceremony at the UN in Vienna.

Andreas Beckmann, Managing Director of the WWF Danube-Carpathian Programme, praised the ICPDR, by saying that the WWF

had awarded the ICPDR a Gift to the Earth, its highest award, in recognition of the transformational role that it has played in promoting and securing clean flowing rivers as well as healthy habitats and species in the Danube River Basin. He emphasised the fact that the ICPDR was “a model for integrated river basin management across the world’s most international river basin.”

Helge Wendenburg, the current President of the ICPDR, said that he was honoured to receive the award on behalf of the ICPDR and went on to stress that although the focus of the ICPDR is on the Danube River Basin, many of the issues dealt with by the organisation, such as water quality and freshwater conservation, are global issues that affect everyone. Concluding his speech, Mr Wendenburg said that he hoped that the benefits the ICPDR brings to the Danube River Basin would also be shared by all the people in the world and said that the ICPDR was very happy to be working with a global organisation like the WWF that shares the same values as the ICPDR.

Moldova is the winner of the International Danube Art Master Competition 2018

On 29 October 2018, the winner of the ‘International Danube Art Master 2018’ competition was announced by Susanne Brandstetter, Chairperson of the Public Participation Expert Group for the ICPDR. The winner was 17-year-old Ion Zatic from Moldova.

The title of Ion’s winning artwork was *Everything that man touches is transformed into a closed ecosystem!* A student at the Corjova School in Moldova, Ion is concerned about the damage caused to natural habitats by industrialisation and urbanisation. His creation appeals for everyone to put more efforts into preserving existing natural ecosystems instead of creating artificial ones.

Second place went to 13-year-old Anais König, a student at the Lycée Français in Vienna Austria, for her project Inspired by the Danube, and third place was awarded to Sara Đuka, Tamara Petrović and Marija Rašković from Prva Beogradska Gimnazija, Belgrade, Serbia for their project entitled *Play by the Danube*.

Video category The video category was won by the short video “*We are Danube*” created by Katarína Kováčová, Agáta Klimešová, Denis Gerža and Linda Várošová from the Design School in Bratislava. Their message is that the Danube is an important natural habitat for countless species of animals, plays a significant role in people’s lives and creates a strong bond between the countries that share the Danube; a bond that people should appreciate and cherish.



Second place in the video category was awarded to a group of 8th and 9th grade students from the Georgi Benkovsky Comprehensive school in Teteven Bulgaria for the *cleaning and restocking of the Bely river* with baby trout for a healthier Danube.

Third place was awarded to a team of international School exchange students from the Anton-Bruckner-Gymnasium in Straubing, Germany and Brucknergymnasium Wels, Austria for their video, *Donauforscher* (the Danube Researchers) which deals with the subject of water pollution caused by microplastics.

Transnational Cooperation for Sediment Management in the Danube River



▲ The Danube River, east of Vienna, view from Braunsberg;
Foto: © Philipp Gmeiner, IWHW-BOKU, Vienna

The transport of sediments, such as gravel and sand, is a natural process in river systems. Over the decades, human activities along the Danube and its tributaries have led to substantial changes in the natural sediment regime. These changes negatively influence important water management issues such as flood risk and erosion protection, inland navigation, biodiversity and hydropower production. In order to address these changes, we need an integrated sediment management plan for the Danube. The ICPDR recognises the seriousness of this issue and identifies this lack of management in the Danube River Basin Management Plans for 2009 and 2015.

To tackle this challenge, policymakers, researchers, administrations, environmental organisations and companies from nine countries along the Danube began working together on the DanubeSediment project in January 2017. The two-and-a-half-year project seeks to improve water and sediment management, as well as the morphology of the Danube River. It has a budget of €3.56 million and is co-funded by the European Union (ERDF and IPA funds) through the Danube Transnational Programme.

Closing knowledge gaps

The project partners began by collecting data on sediment transport throughout the Danube and its main tributaries. Joint measurement campaigns in Austria, Romania and Serbia enabled a comparison and harmonisation of the methods used to collect sediment data. The project team will use this data to calculate a Danube-wide sediment balance. This sediment balance will analyse the sources, sinks and redistribution of sediment throughout the Danube.

In order to understand the reasons for the changes in sediment quantity and continuity, the project is reviewing key drivers and pressures on the sediment balance and assessing their impact. Supported by stakeholders throughout the basin, DanubeSediment is collecting good practice measures to improve sediment transport. These measures should in turn reduce habitat loss by improving and securing river system functionality.



Strengthening governance

One of the main tasks of the project is to deliver recommendations for policy-makers in the field of sediment management. The project will publish a “Danube Sediment Management Guidance” document, making suggestions to improve monitoring and planning of sediment-related measures. Igor Liska, Technical Expert for Water Quality and Water Management at the ICPDR, says: “We are looking forward to the results of the DanubeSediment project, which will provide the ICPDR with essential input for the 3rd Danube River Basin Management Plan and the 2nd Danube Flood Risk Management Plan.”

Improving sediment management in practice

To make the project results understandable and applicable for key stakeholders in different fields of sediment management, the project partners are actively including external experts, practitioners and policymakers. Regular events take place in each partner country, enabling participants to transfer knowledge and experiences within the project and amongst each other. For example, in April 2018, the project invited an array of experts from throughout the Danube River Basin to a workshop in Budapest to discuss innovative sediment monitoring methods.

This network of stakeholders from different sectors is closely involved in preparing the project outputs. Based on their input and cooperation, the project will publish a “Sediment Manual for Stakeholders”. Prof. Helmut Habersack, from the Institute of Hydraulic Engineering and River Research at the University of Natural Resources and Life Sciences in Vienna, explains: “To address the needs of key stakeholders, the manual will provide each target group with a collection of specific good practice measures to improve the sediment balance.”

By fostering cooperation across borders and sectors, DanubeSediment is contributing to the development of integrated sediment and water management that will benefit both the environment and the well-being of people.



▲ The two photos show instruments used to monitor sediment. The top photo shows a US P63-Sampler, which is a best practice device for monitoring sediment. The photo directly above shows a water sampling method used to analyse suspended sediment. Foto: © Marlene Haimann / IWHW - BOKU

! **Hanna Skiba**, is the communication manager of the DanubeSediment Project and works at the Bavarian Environment Agency in Germany

! **For more information** visit our website www.interreg-danube.eu/danubesediment.

If you would like to find out more about our project, please feel free to contact us at danubesediment@lfu.bayern.de

International Waters Learning Exchange and Resource Network - IW:Learn



The objective of Global Environment Facility International Waters Learning Exchange and Resource Network (GEF-IW:Learn) is to strengthen transboundary water management by facilitating the collection of data, information and knowledge required to sustainably manage shared water resources among stakeholders. These stakeholders include managers, governments, partners, implementation agencies and NGOs.

What the GEF IW:Learn project is about

The IW:LEARN project was established by the Global Environment Facility (GEF) to strengthen transboundary water management around the globe by collecting and sharing best practices, lessons learned, and innovative solutions to common problems. Based in Paris, it promotes experience sharing and learning among the GEF International Waters projects and partners. The project is implemented by the UNDP and UNEP, and executed by IOC-UNESCO.

The GEF

The GEF is an independent financial organisation which was established on the eve of the 1992 Rio Earth Summit to help tackle our planet's most pressing environmental problems. It provides grants and also deploys non-grant instruments to developing countries and countries with economies in transition, for projects related to biodiversity, climate change, international waters, land degradation, the ozone layer and persistent organic pollutants. Over the past 27 years, the GEF has developed into an international partnership of 183 countries. It has provided over \$17.9 billion in grants and mobilised an additional \$93.2 billion in co-financing for more than 4,500 projects in 170 countries.

The GEF and the ICPDR

By the mid-1980s, the need for urgent action in the Danube Basin had become clear. Over the previous 150 years, growing human populations and booming industries had wreaked serious environmental havoc. Around 80 percent of the Danube's wet-



lands and floodplains had disappeared since the end of the 19th century, threatening key species – ranging from pelicans in the Danube Delta to sturgeons, in the Lower Danube and beavers in the Upper Danube – and leading to worsening floods across the basin.

Pollution, especially from organic substances and nutrients, posed a major long-term threat to the environment. The GEF therefore began its work in earnest with a single goal: to build the willingness and capacity between a diverse group of riparian nations to work together. The working hypothesis of the GEF's International Waters intervention was to get countries to realise the benefits of shared water resources through cooperation with their neighbours. Everyone in the Danube Basin needed to understand the benefits of working together to share and improve transboundary resources.

By the early 1990s the European Union had replaced the Soviet Union as the region's dominant economic engine and the promise of EU accession and the subsequent need to meet its stringent environmental directives provided the driving force for environmental change in the Danube Basin. The GEF and the United Nations Development Programme (UNDP) provided countries with significant assistance to help build their capacity to meet the EU's accession and legislative challenges.

In 1994, 11 Danube countries and the European Commission met in Sofia to sign the Danube River Protection Convention. This agreement provided the overall legal framework for the protection and sustaina-

ble use of water and other shared ecological resources in the Danube Basin. The Convention came into force four years later, and just a few days after this important event the ICPDR and its Permanent Secretariat was created to act as the main implementation body of the Danube Convention.

The GEF's experience in the Danube illustrates the necessity of working

at various spatial, temporal, and political levels. It's involvement began with a regional focus, supporting steps toward a binding, international convention. Once this framework was in place a top-down approach was adopted, ranging from basin-wide agreements, the implementation of bi-national, national and local measures, through to working with individual farmers to improve their practices. The lessons learnt from the GEF are now being applied to other transboundary waters, such as the Benguela Current off the southern African coast, Lake Victoria, and the Guarani Aquifer located beneath the surface of Argentina, Brazil, Paraguay and Uruguay, as well as Orange-Senqu River Basin.

The support provided by the GEF and the UNDP has turned the Danube into a model of integrated river basin management, enabling the ICPDR to implement the Water Framework Directive (WFD), which has now become the benchmark for European transboundary water bodies. The GEF has also supported the Commission in its philosophy of adopting a holistic approach to the pressures facing the river, including eutrophication problems caused by agricultural inputs, the importance of flood buffering attributes of riverine wetlands, and the critical need to improve tariff and charge schemes for water and sanitation systems.

Ultimately, GEF and UNDP efforts in the Danube and Black Sea area have become a model for expanding public awareness of the need to embrace integrated water resource management as a way of ensuring that economies can grow without environmental destruction.

This Strategic Partnership serves as an example of how the GEF can be a catalyst for addressing serious transboundary environmental water problems by leveraging significant additional funds from key European Union institutions. It is also successful because of its ability to work with key implementing agencies – including the World Bank, the UNDP and the United Nations Environment Programme (UNEP) – to develop complex, multi-faceted projects.

GEF projects benefit the global environment, linking local, national and global environmental challenges and promoting sustainable livelihoods. Over the past 27 years, the GEF has supported a range of notable achievements:

Protected areas: investment in over 3,300 Protected Areas, covering more than 860 million hectares, an area larger than the size of Brazil.

Sustainable land and seascape: biodiversity protection and planning for more than 350 million hectares of productive landscapes and seascapes.

Sustainable land and forestry management: 103 million hectares are under sustainable land management. Support has been provided for over 380 forest-related projects, with \$2.1 billion in grants that have leveraged an additional \$9.5 billion.

Greenhouse gas (GHG) emission reduction: support for 940 climate change mitigation projects expected to contribute 8.4 billion tonnes of direct and indirect GHG emission reductions over time.

Integrated water resource management: sustainable management of 43 transboundary river basins in 84 countries.

Safe disposal of hazardous chemicals: support for the phasing out of 29,000 tons of ozone depleting potential (ODP) materials and the sound disposal of more than 200,000 tons of persistent organic pollutants (POPs) in developing countries.

Adaption to climate change: vulnerability reduction for more than 11 million people in 130 countries.

What the GEF has done for the Danube:

- ◆ the UNDP/GEF Danube Regional Project Phases 1 & 2
- ◆ financing of \$17.35 million from GEF; co-financing of \$19.48 million
- ◆ duration of project: November, 2001 – August, 2007.

The UNDP Danube River Basin Regional Project was successful in contributing to

sustainable human development and capacity building, as well as regional cooperation and coordination in the Danube River Basin and the Black Sea area. It also enabled the sustainable management of natural resources and biodiversity by defining priority actions for nutrient reduction and pollution control.

IWC9

The GEF Biennial International Waters Conference (IWC) is the signature learning event for the GEF International Waters portfolio of projects and partners. IWCs bring together project managers, technical experts, participating country representatives, NGOs, private sector and GEF Agency staff from more than 700 ongoing projects in 70 countries. The IWC's principle objective is to facilitate cross-sectoral and portfolio-wide learning and experience-sharing.

Held in Marrakesh, Morocco, from 5-8 November 2018, the Ninth GEF Biennial International Waters Conference (IWC9) brought together about 300 participants from 85 countries to focus on economic valuation as a tool for protecting and managing the world's freshwater, groundwater and major marine ecosystems.

The overriding theme of IWC9 was Sustaining International Waters Cooperation, with discussion tracks devoted to building traction for the GEF's Transboundary Diagnostic Analysis-Strategic Action Programme process, toward 2030 and beyond, and to employing practices and tools for more informed decisions and the better management of systems. The

Conference featured visionary speakers, campfire-chart style learning clinics, participant-led workshops, lightning talks, small roundtable discussions, and a film festival.

ICPDR representatives attended the conference to share experiences, learn more about the achievements of other members' projects, and also to discuss the future within and beyond the IW community. As part of the technical workshop for fresh-

water ecosystem projects, the ICPDR led a workshop designed to inform interested participants on freshwater and groundwater resource management by providing a case-study analysis and replicable examples in order to:

- ◆ identify common interests in successful projects,
- ◆ identify solutions that work (not only for the Danube River Basin context but also beyond)
- ◆ share lessons learned.

The workshop provided participants with a comprehensive overview of transboundary cooperation and shared water system management areas covered by the ICPDR, with specific focus on the following aspects:

- ◆ the key attributes of an international river basin organisation (RBO) from a legal and institutional perspective
- ◆ the key challenges for establishing a transboundary RBO
- ◆ the challenges in rallying public opinion to acquire the necessary political support for setting-up an RBO

The aim was to enhance participants' knowledge skills, enabling them to set-up and improve the institutional framework of their institutions based on the survey conducted by IW-Learn.

As part of its support for the GWF-IW:Learn Program, the ICPDR is committed to raising awareness and experience of adaptive management and the strengthening of basin organisations by utilising leveraging partnerships. This is embedded in the ICPDR's engagement in ongoing exchanges with different basin organisations concerning approaches and methods for transboundary cooperation and adaptive management. This is particularly the case regarding the sharing of lessons on the legal and institutional frameworks of RBOs, methodologies for basin management and planning, and the involvement of stakeholders.

Hélène Masliah-Gilkarov is the Technical Expert for Public Participation and Communication in the ICPDR Secretariat, and the Executive Editor of Danube Watch

Learn more about the GEF IW initiative for the learning exchange and resource network www.iwlearn.net/abt_iwlearn

The (dis)balance of sediments in the Danube River Basin

As a lifeline for both people and nature, the Danube River has to meet a wide range of needs: it provides drinking water, is a trans-European navigational corridor, serves tourism and local recreation, provides energy and ecosystem services and is essential for the natural environment. In order to make better use of this essential lifeline, the Danube and its tributaries have been gradually altered over the years to enhance flood control, navigation and, more recently, hydropower. Point and diffuse pollution, increased agricultural use and forestry development are intensifying the aforementioned impacts. According to the ICPDR, when compared to the 19th century, less than 19% of the Danube River Basin's former flood plains remain. The rich and unique biodiversity and river habitats along the Danube are at risk.

As a result of numerous interventions, the sediment regime of the Danube has changed drastically over the last century. The consequences of these interventions on the river and the sediment regime are currently being investigated by the EU-funded

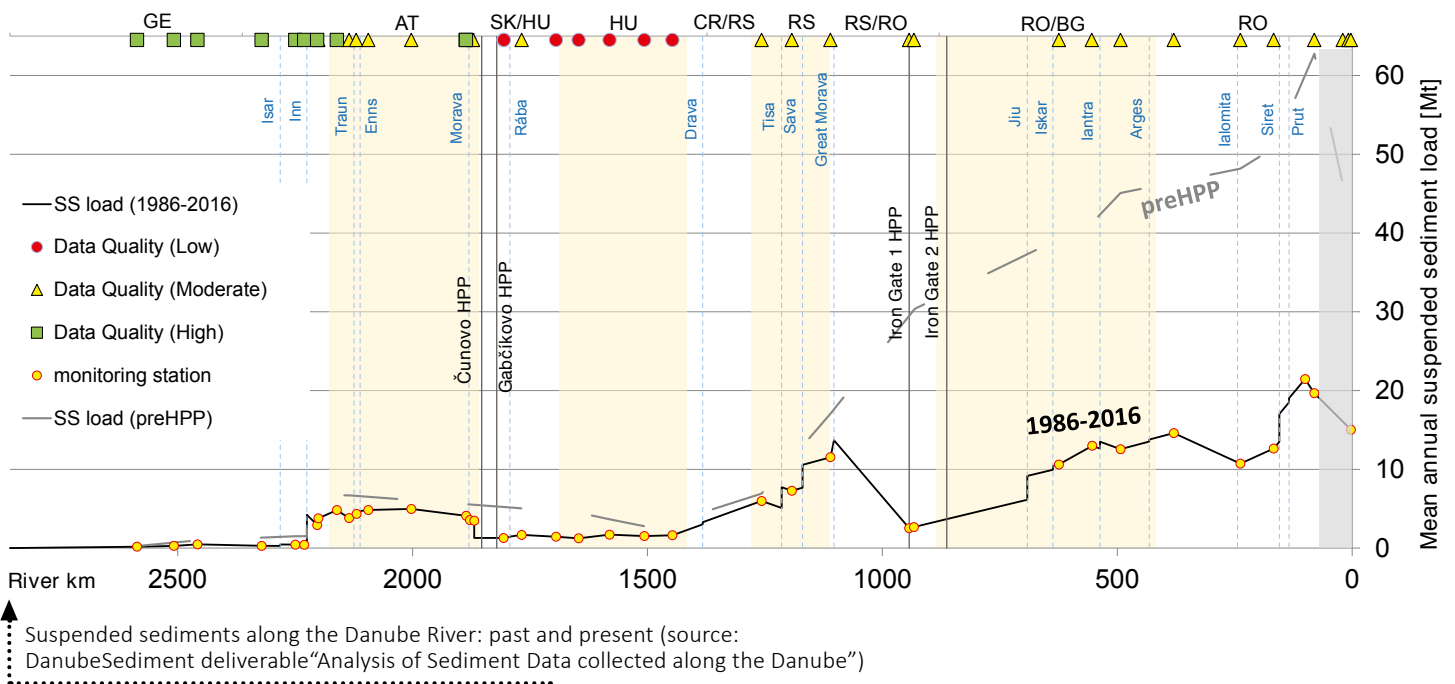
project DanubeSediment. The project will receive the first sediment budget for the entire Danube River and will improve our understanding of the process and close knowledge gaps (for more information about the project see the article "Transnational Cooperation for Sediment Management in the Danube River" in this issue of Danube Watch). Only with the help of this Danube-wide sediment analysis, can we propose measures and make recommendations to improve sediment management.

Sándor Baranya, Associate Professor at the BME Budapest, coordinates data collection and monitoring in the DanubeSediment project and says: "Our project will deliver the first comparison of historical and current sediment transport data along the whole Danube River." A graph has been prepared, based on the monitoring data provided by the project partners, showing the development of suspended sediments along the Danube River (Figure 1). The results clearly show the effects of interventions from the Upper Danube through to the Danube Delta. Today, the Danube transports less than

half of the historic amount of about 60 million tons of suspended sediments into the Black Sea. These sediments are primarily trapped in the reservoirs of the hydropower plants where sedimentation occurs due to reduced flow velocities, shear stress and transport capacities. During major flood events, these fine sediments can be remobilised, for example in the reservoirs of the Upper Danube, leading to siltation and thus an increase in damage to the flooded areas in the event of inundation.

In contrast, the remaining five free flowing sections of the Danube are experiencing a sediment deficit due to the longitudinal and lateral interruption of the sediment continuum. Furthermore, the width of the Danube is being reduced (Figure 2) and the gradient increased because of a reduction in the length of the river, which – in combination with the canalisation and disconnection from floodplains – has led to an increase in the sediment transport capacity of the river. In addition, the Danube River lacks lateral self-forming processes due to river training measures such as bank

Longitudinal variation of mean annual suspended sediment load (1986-2016) vs. preHPP period



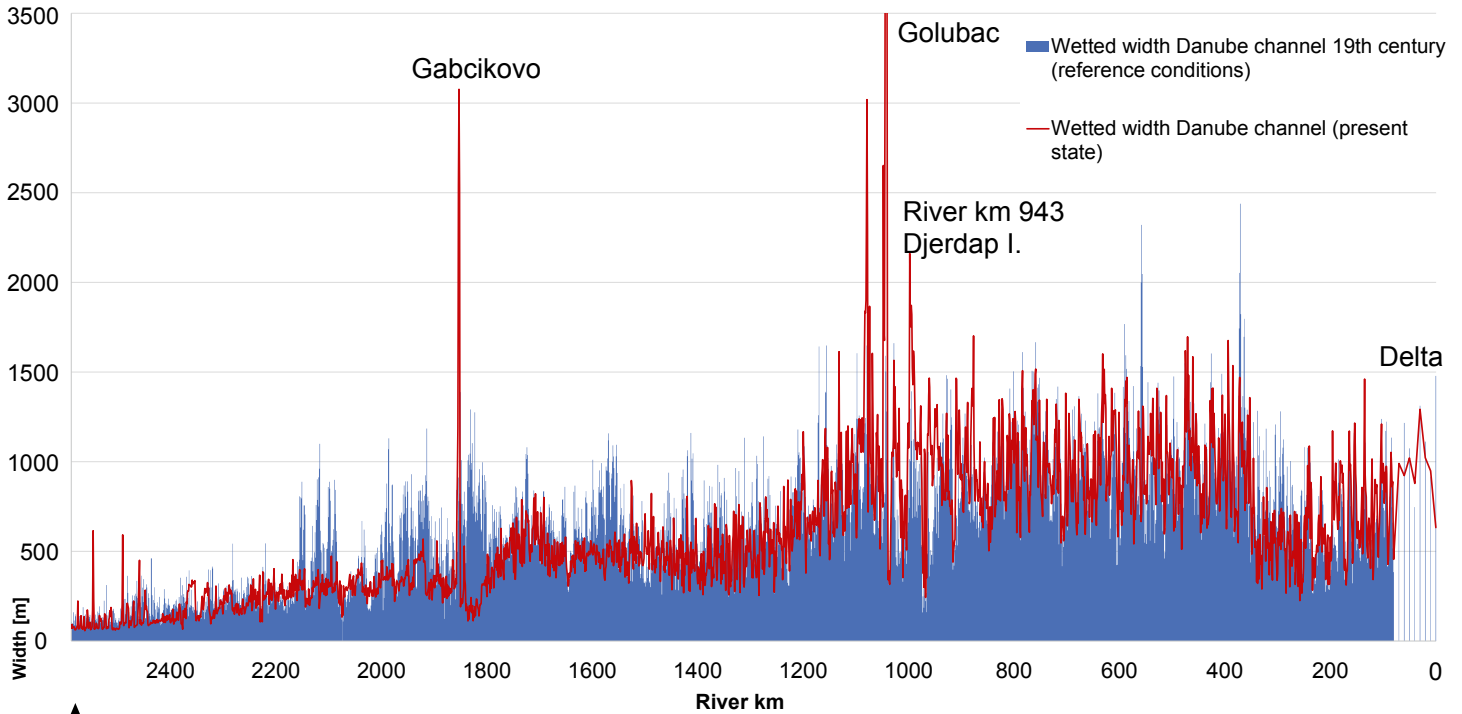
protection, resulting in correspondingly reduced morphodynamics in the non-impounded sections. As a consequence, there are various forms of riverbed degradation and a lack of instream structures in the remaining free-flowing sections. The restricted lateral erosion and lateral branching also limits the sediment input from the side and riverbanks, thereby reducing the lateral exchange of sediments (deposition and erosion).

Overall, the data shows a strong disbalance of the sediment regime, resulting in a severely disturbed system throughout the whole Danube River Basin.

Katarína Holubová from the Slovakian Water Research Institute, who coordinates the assessment of the sediment balance, explains: “DanubeSediment provides an agreed sediment balance for the whole Danube River that is based on sediment

iment processes. “DanubeSediment not only analyses the processes and status, but also puts together measures that are capable of improving the sediment balance and related river management” says Florin Vartolomei from the National Administration “Romanian Waters”, who is responsible for coordinating the collection of measures. Sustainable sediment management and the implementation of good practice measures in the Danube Basin can im-

Danube River channel width change: whole Danube



Width of the Danube River: past and present (source: based on DanubeSediment deliverable “Long term-morphological development of the Danube in relation to the sediment balance” in prep.)

These combined factors are leading to an erosion of the riverbed of up to several centimetres per year in the free-flowing sections. As a result, man-made structures such as bank protection measures are undermined, putting their stability at risk. Additional consequences are that groundwater levels are lowered, side arms become disconnected, instream structures are lost and habitat quality deteriorates, affecting the ecological status of the river and valuable floodplains. This affects coastal morphology, leading to increased coastal erosion of up to 20 to 25 m per year. In the Danube Delta, the lack of sediments combined with the cutting-off of meanders, regulation and dredging are also leading to erosion in the main branches of the Dan-

transport data, the comparison of the historical and the present state of morphology and dredging data.” Setting up a sediment balance helps to understand the functional behaviour of the river system at various levels, which in turn allows for the assessment of the consequences of human intervention. This is important because interruption of the sediment balance results in an increasing difference between surplus and deficit of sediment, which leads to increased reservoir sedimentation, risk of flooding, problems for navigation at bottlenecks and deterioration of the ecological status of the river. In order to develop sustainable sediment management for the Danube River, we need an improved understanding of sed-

prove navigation conditions, reduce flood risks, enhance ecological status and sustain hydropower production. “DanubeSediment clearly shows that sediments are of serious importance for the future Danube River Basin and Flood Risk Management Plans.” says Ivan Zavadsky, Executive Secretary of the ICPDR.

Prof. Helmut Habersack, is Head of the Institute of Hydraulic Engineering and River Research at the University of Natural Resources and Life Sciences, Vienna (BOKU) and is coordinator for the Stakeholder Manual and Guidance documents within the DanubeSediment Project.

A photograph of a diverse group of people at a public meeting or conference. Many individuals have their hands raised, indicating active participation. The scene is brightly lit, and the background is slightly blurred, focusing attention on the participants in the foreground.

HOW PUBLIC PARTICIPATION IS CHANGING

Until recent years, the options available to the public when it came to participating in the management of their own waters was limited at best. National and local governments would often authorise water development plans, infrastructure projects, and the privatisation of water services without consulting the local community. This sometimes undermined livelihoods in local communities and led to both individuals and organisations increasingly demanding greater consultation with more transparent and accountable decision-making. The times, however, are changing.

Increasing environmental awareness, a greater understanding of how it affects human health, plus the more direct contact of social media all mean that public participation in these processes is very much on the rise. The public now, and rightfully so, very much expect the opportunity to participate easily in the policy-making processes that concern their environment. This is a vital shift, considering that environmental policy and management only succeed if key stakeholders feel engaged, and buy into the design of all the actions concerned.

Today, a 'bottom-up' approach means that people can share information and responsibilities; they can partake in the design

of programmes; monitor and evaluate progress; and all without central management. Key forms of participation, such as the dissemination of information, public advocacy, public hearings and litigation, assist environmental decision-makers in identifying the concerns of the general public. A recent shift towards decentralising strategies also encourages the active participation of organised groups, communities, and citizens at a more local level.

UPDATING OUR PARTICIPATION PRACTICES

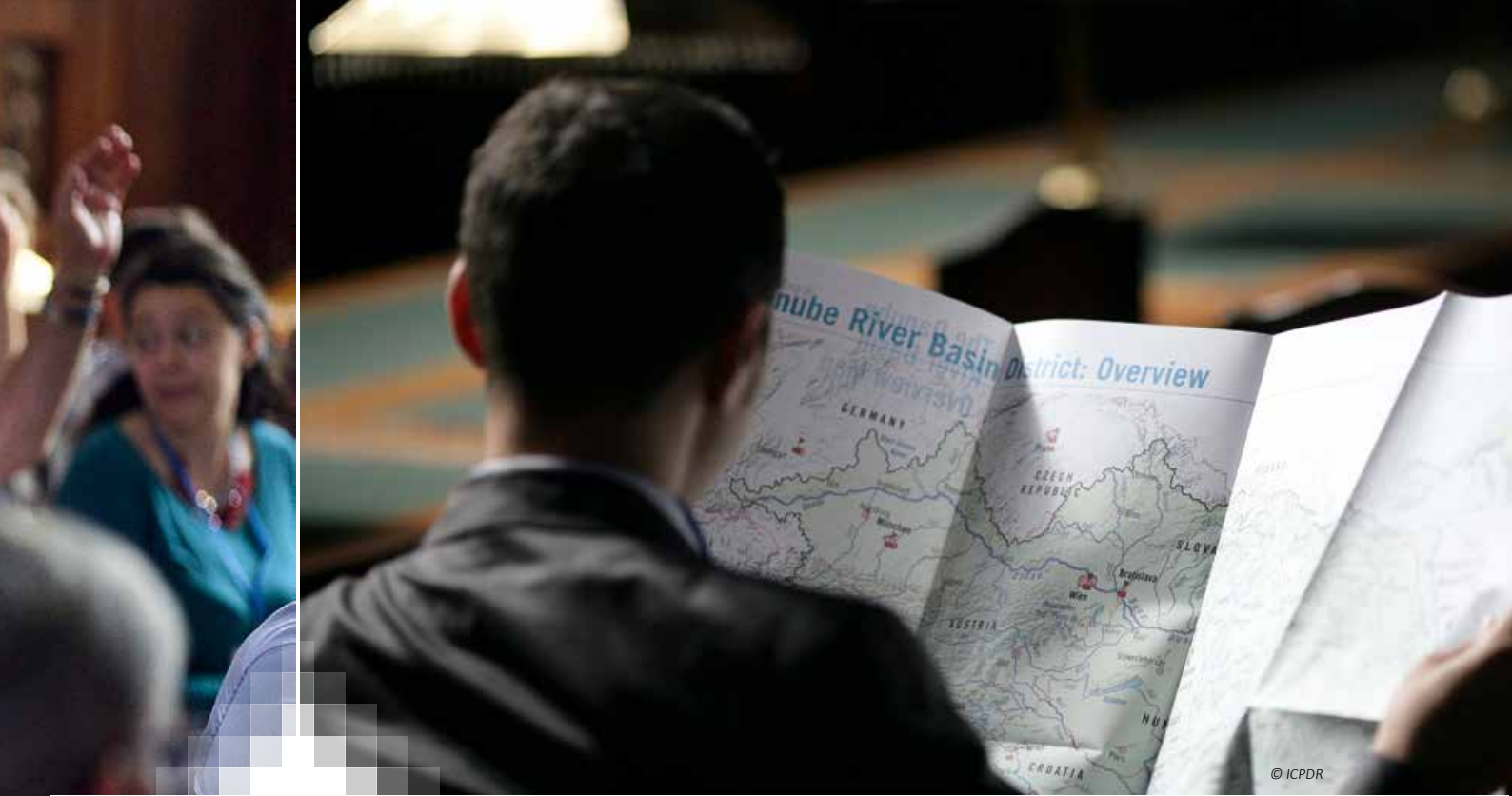
So what does this mean for the ICPDR? One of our most important commitments is to encourage public participation in all our activities and decision-making wherever possible - so it most definitely means good things for us! The increasing number of ways in which the public can be reached is useful for broadening our methods and putting together a new plan for engaging the public, exploiting rising awareness in order to facilitate broader support for our policies and greater efficiency in their effective implementation.

The ICPDR is committed to active public participation in its decision making. The commission believes that this facilitates broader support for policies and leads to increased efficiency in the implementation of actions and programmes. Active

consultation with stakeholders takes place throughout the entire cycle of all ICPDR activities, ranging from developing policies, to implementing measures and evaluating impacts. A legal framework for this is provided by Article 14 of the EU Water Framework Directive along with Articles 9 and 10 of the EU Floods Directive.

Working to a six-year working cycle, we updated our plans for the Danube River Basin Management Plan (DRBM) and Danube Flood Risk Management Plan (DFRM) in 2015. The update was accompanied by new requirements for public consultation. Carried out in three main phases, we collected comments from the public during the update, asking them about the timetable and work programme, as well as water and flood management issues. These public consultations each spanned periods of at least six months, utilising the ICPDR network to gather and disseminate information. The resulting timetable and work programme was then published and made publicly accessible. Six years hence, it is now time to replicate this exercise.

Our planned update to proceedings in 2021 will follow on with this emboldened programme of public consultation, along with information and educational initiatives aimed at keeping our stakeholders and the public well-informed. These include the



Danube Day - celebrating everything about the river annually on 29th June - the publication of our in-house magazine, Danube Watch, three times a year and consultation workshops such as Voice of the Danube.

INFORMING THE PUBLIC

Communities can become more meaningfully involved in the work of the ICPDR if they are well informed about its objectives and structure. Public information, educational initiatives and outreach activities are therefore already being utilised to support public participation, in addition to the more general use of social media as a communication tool. The ICPDR is currently engaged in the following public participation activities:

- ◆ public information dissemination. This includes social media posts, technical reports, public documents and general publications (e.g. Danube Watch);
- ◆ awareness-raising educational resources, including environmental education. This includes a variety of proposed new materials, awareness raising activities (e.g. the annual Danube Day festivities) and outreach;
- ◆ public consultation activities. These can be events such as Q&A sessions regarding the development of river basin management plans, and the opening of

subject-related communication channels or consultation workshops. The use of ICPDR.org for publishing information about these issues is essential.

Acting early is also important. By ensuring buy-in and a sense of ownership in our target audience at an early stage of the process, any basin/sub-basin approach will stand a better chance of success.

The benefits of early engagement in the development and design of our two plans and projects include:

- ◆ fewer misunderstandings, fewer delays and more effective implementation and monitoring;
- ◆ the resulting smoother running of a project can lead to more cost-effective solutions;
- ◆ all later decisions are more likely to receive public acceptance, commitment and support. Attitudes to the decision-making process will also be generally improved;
- ◆ increasing stakeholder awareness of the various issues in the related river basin district and sub-basins before environmental efforts become worse and thus harder to resolve;

- ◆ helping to normalise common discourse earlier in the implementation process.

GETTING INFORMED BY THE PUBLIC

Just as important as us communicating with the public, is the public communicating with us. A key part of the ICPDR's communication strategies is always direct consultation and enabling the public to send us all of their comments and raise all of their concerns regarding Danube River Basin management issues. This could be suggestions for new wording, raising questions, providing fresh scientific information - everything is of value. Major activities tend to happen at six-monthly intervals. For example, we are currently collecting comments on our draft timetable, work programme, and the statement of our consultation measures. All comments will be included in a revised version to be published in the autumn of 2019.

◆ **Hélène Masliah-Gilkarov** is the Technical Expert for Public Participation and Communication in the ICPDR Secretariat, and the Executive Editor of Danube Watch

Read online

The schedule for the WFD and FD public participation can be viewed at: <http://icpdr.org/main/pp-2015>



Reaching out to the people of the Danube

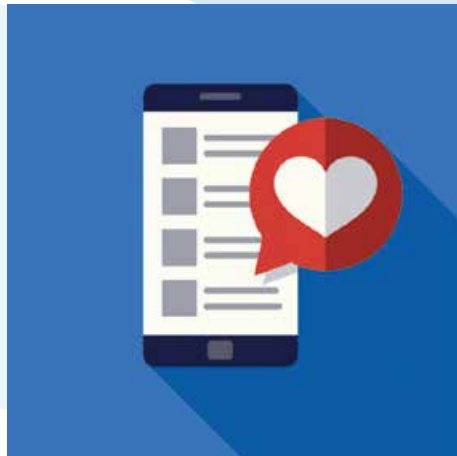
the ICPDR launches its new social media channels



Facebook 
our image platform:



Twitter 
our News Ticker:



Instagram 
our Visual storyteller:



Technical experts and members of expert groups at the ICPDR are working tirelessly for the Danube River Basin and its people. Now we want to give every single resident of the Danube Basin an opportunity to make their voices heard and get involved in restoring and safeguarding the waters of the basin for future generations. Social Media is an excellent tried and tested channel that is perfect for such a challenge.

The constant development of our communication activities, under the lead of the dedicated Public Participation expert group (PP EG), have allowed the ICPDR to position itself and to present our work for the Danube in an increasingly visible manner. Now we would like to get to know our various stakeholder groups even better. To achieve this, the ICPDR officially launched its social

media channels on Facebook, Twitter, Instagram, and YouTube on November 30th 2018. We now invite all of you to be part of this process and to help us share with the world everything that makes the ICPDR so special. Each day you act as the keeper of the Danube and it is time to tell your stories.

Opening ourselves up to communication also means showing confidence in our competences and bringing our expertise to a broader public. These additional communication channels will contribute to strengthening our image and reputation, building our credibility with an even wider audience and persuading even more people to support our mission.

With our social media channels, we are not only engaging in dialogue and interaction with a wider public audience, we are also

making sure that information is disseminated among all members of the internal ICPDR family. Exchanging information, discussing important themes and relaying them to the outside world is also a vehicle for the promotion of our internal, multi-disciplinary communication as we strive to strengthen our common interests.

The widespread use of social media is growing at a phenomenal pace. Facebook alone saw over 2.13 billion monthly active users worldwide in the fourth quarter of 2017. With their continued annual 14 percent increase in user activity, it is clear that social media outlets represent an excellent opportunity and have become a must for organisations who wish to communicate with their internal and external stakeholders.

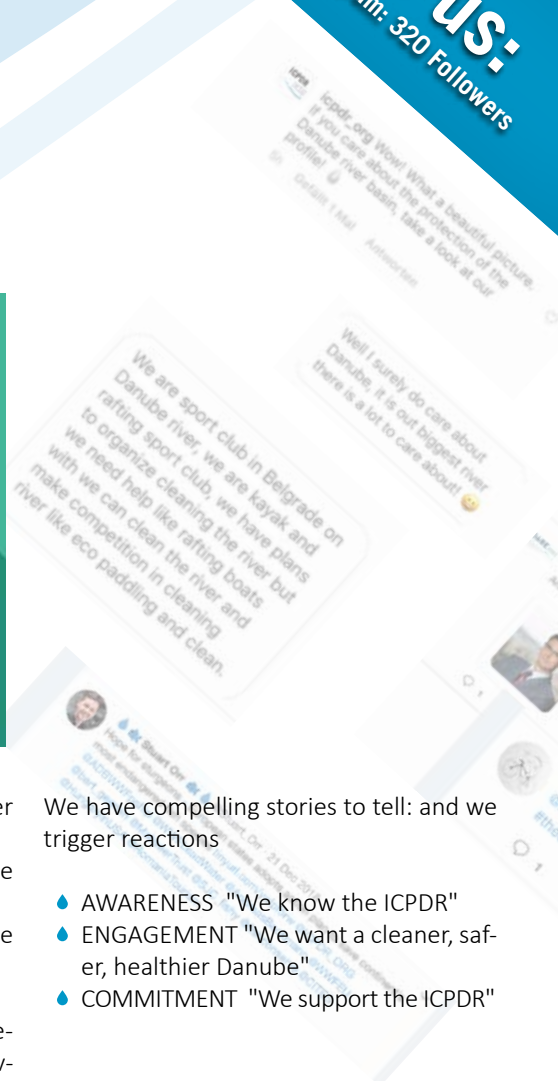
With the launch of this initiative, the ICPDR



YouTube
 our news archive



LinkedIn
 professional platform:



social media communication network is seeking to expand its outreach, and better integrate messages to current users by keeping them informed of new developments and activities. For the ICPDR, the advantages of a social media presence network include:

- construction of sustainable networks
- immediate and direct communication
- demonstration of presence and activity
- promoting participation and building dialogue through mutual communication channels
- transparency and creation of trust
- providing information in real-time
- making use of the dissemination mechanisms of social media platforms
- promotion of engagement

The ICPDR has a great base for effective social media presence:

- 19 countries share the Danube River Basin
- more than 81 million people call the Danube Basin their home
- we are working 24/7 for the Danube Basin and its people

The PP EG group is the driving force behind this initiative and is currently striving to increase its outreach by carrying out research to select appropriate platforms that will reach all the people we want to reach. We presently have several methods of visualising information for our stakeholders. However, the PP EG's primary objective is to actively engage with stakeholders and involve them in ICPDR activities. Social media is an invaluable tool that can be used to increase the PP EG's reach to the broader public.

We have compelling stories to tell: and we trigger reactions

- AWARENESS "We know the ICPDR"
- ENGAGEMENT "We want a cleaner, safer, healthier Danube"
- COMMITMENT "We support the ICPDR"

The Public Participation Expert Group (PP EG) is the ICPDR expert group dedicated to supporting ICPDR activities related to communication and participation issues. These include public consultation measures for the Danube River Basin Management and Flood Risk Management Plans, publications and outreach initiatives such as Danube Day and environmental education.

Stakeholders' Forum –

Improving performance through mutual respect and a common vision

Towards sustainable solutions through long-term partnerships with stakeholders



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The Stakeholders' Forum is a concept established to ensure transparency in project management and is recognised throughout all the Danube riparian countries. In Serbia it was originally incorporated into the project "Preparation of Documentation for River Training and Dredging Works on Critical Sectors of the Danube River in Serbia", a 100% EU funded project implemented during the period 2011-2014.

The successor to this project, "River Training and Dredging Works on Critical Sectors on the Danube River and Supervision and Environmental Monitoring of River Training and Dredging Works on Critical Sectors on the Danube River", will ensure the continuity of the Stakeholders' Forum. It also aims to maintain the good practice measures from the previous project and the long-term orientation of the Directorate for Inland Waterways, as the End Recipient of the Project.

This project kicked off in 2017 with the signing of two contracts between the Serbian government, the Spanish engineer-

ing consultancy firm, ACCIONA Ingeniería S.A as service contractor, the consortium Agromah Ltd, Regulacije Ltd and Kolubara Ltd acting as the works contractor. The Project is 85% financed by EU funding and is co-funded by the Republic of Serbia. The overall objective of this project is to improve navigation conditions on the Danube River in accordance with the national policy and strategy provisions. This is also in accordance with the Danube Commission's recommendations and the EU transport system development plans designed to **ensure fast, safe, reliable and environmentally friendly transportation, the smooth flow of freight and mobility of people**. To achieve this ambitious objective, dredging and river training measures have been designed for six critical sectors for navigation on the Danube River between Backa Palanka and Belgrade. This will involve the construction of three river structures and dredging at five critical navigational sectors.

The project promotes interconnectivity between different expert areas and var-

ious institutions and organisations are welcome to participate as Stakeholder Forum members and observers. Most of the rules of the organisation and work of the Forum have been retained from the first forum as a method of recording liaisons between the Forum results, along with the exchange and dissemination of opinions on the overall project development.

The basic principles on which the Forum is established include voluntary, free membership, mutual acknowledgment and respect of the different standpoints of the other Forum members, and full transparency of the work being implemented. The Stakeholders' Forum is a multidisciplinary body in which different interests are represented, including water management, environmental and nature protection, hydrotechnology, industry, archaeology, fishing and poultry. **Members** of this advisory body include the ICPDR, the Institute for Nature Protection of Vojvodina, WWF, Aqua et Archaeologia, the Bird Protection and Study Society of Serbia and the United Fishermen of Serbia. A number of observ-

ers also take part in Forum meetings, including the relevant Serbian ministries and other governmental institutions interested in the project, international river commissions, waterway administrations from other Danube countries, as well as NGOs which are not members of the Forum.

All Forum documents are prepared and distributed in both Serbian and English to reflect the wider importance of the work of the Forum and are available on the Plovputs' website (www.plovput.gov.rs/

[forum-zainteresovanih-strana](#)), along with other information. The website is constantly updated in order to keep all stakeholders up to date with the newest outputs of the project development and to ensure the transparency of completion of objectives.

The chairperson for the Forum is a representative from Plovput, whose role is to ensure that all Forum members receive equal treatment and is also responsible for all aspects of the organisation of Fo-

rum meetings. The chairperson is also a link between Forum members and the consultants, thereby ensuring the proper flow of information between them. Forum members have the right to raise specific questions, as well as to make recommendations for further investigations and more detailed analysis of different issues that could emerge during the project's implementation.

Two meetings were held during the period of March to May 2018, whereby all Forum participants contributed to the exchange of experiential and expert opinions. Since most of them also dealt with the implementation of the preparation phase of this project, their involvement is of great significance in **enabling the continuous process of implementation of a two-phased project.**

It is hoped that the Forum's role will increase as an interactive component and that its advisory role will unlock new perspectives for a number of methodological measures that will hopefully improve supervision and environmental monitoring procedures, as well as streamlining the implementation of compensatory measures, in accordance with defined procedures.

The possibility to see the project development at first hand will certainly be the subject of upcoming meetings, with multilevel participation of both Forum members and observers resulting in **a unified project for a unified river.**

■ **Milica Gacic**, MSc., GIS administrator
Directorate for Inland Waterways
Plovput, Republic of Serbia

■ **Jasna Muskatirovic**, PhD, Head of
Department Directorate for Inland
Waterways Plovput, Republic
of Serbia

■ **Ivan Mitrovic**, M.Sc., Head of Division
Directorate for Inland Waterways
Plovput, Republic of Serbia

■ **For more information about the Stakeholders' Forum and Project progress**, please visit Plovput's official web site: www.plovput.gov.rs



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The Joint Danube Survey

The findings of the three JDS surveys carried out so far have allowed governments to make and implement high-level decisions regarding environmental measures throughout the basin. The key objectives of the three expeditions that have already taken place were:

- to collect data on parameters not analysed during standard ICPDR monitoring
- to collect information about the water and its organisms from single sources along the length of river so that data is readily comparable between countries
- to raise awareness of the quality of the Danube waters and the efforts required to protect and restore them
- to fill the gaps in WFD implementation.

JDS1

The first Joint Danube Survey (JDS1) was carried out by the ICPDR in 2001 and was the most homogenous analysis of water quality and the ecological status of the Danube River ever conducted. Over 140 chemical and biological parameters were analysed and over 40,000 laboratory results were generated.

Tests revealed that organic pollution on certain stretches of the river ranged from moderate to critical, with many sidearms and tributaries being more polluted than the main stream. In certain stretches no macro-invertebrates were found at all – a clear indication of even higher organic or toxic pollution.

Other tests carried out during JDS1 revealed particularly high levels of nutrient pollution in the Hungarian section of the river downstream from Budapest. Insufficiently treated sewage and contamination from farmland and pastures (manure)

were also found to be a problem in this region.

Specific heavy metal pollution hot-spots were detected in the Rusenski Lom, the Iskar and the Timok tributaries in Bulgaria. Pollution from navigation, especially oil pollution, was also found, with high values for petroleum hydrocarbons in sediments and suspended solids being found in stretches of the Middle Danube.

From 23 pesticides under investigation only atrazine and desethylatrazine were found in the Danube. However, significant concentrations of harmful chemical pollutants listed in the WFD List of Priority Substances, were found in bottom sediments as well as in suspended solids.

JDS2

The second survey was launched in mid-August, 2007 and saw 96 sites along the Danube River and 28 on its major tributaries sampled by the three JDS2 boats. JDS2 was the world's biggest ever river research expedition at the time and, as in 2001, the main objective was to produce highly comparable and reliable information on water quality and pollution. After the expedition had ended, scientists throughout Europe analysed water samples, sediment, plants, fish and other aquatic life. This led to a 'Final Scientific Report' and a hands-on public document entitled 'the Joint Danube Survey 2: Research Expedition and Conclusions'. The final results showed that the Danube and its tributaries were becoming cleaner, but measures to reduce particular pressures on the river and its waters were still needed.

JDS3

The third survey took place in 2013 and saw the JDS3 ships once again travel 2,375 km downstream, through ten countries, from the Black Forest to the Black Sea. An

international Core Team of 20 scientists was responsible for sampling, sample processing, on-board analyses and all other survey activities, with leading laboratories across Europe carrying out biological and chemical analyses.

77% of the sites sampled in 2013 were classified as having good or high ecological status, especially in most of the Upper and Lower reaches of the Danube. Moderate status was mostly recorded in the Middle Danube.

JDS3 reconfirmed that Danube plants and animals show a high degree of biodiversity. This was especially so with fish, with over 139,000 individual fish and 67 species sampled. Nevertheless, due to pressures, such as hydropower, poaching and fishing, about 50% to 90% of the sites tested did not meet WFD ecological requirements for fish. Moreover, invasive alien species continue to have a constant impact on native wildlife, such as alien fish depleting the habitats of native Danube fish.

Once again, the survey provided the largest volume of knowledge about the Danube River Basin ever collected through a single scientific exercise, and once again results confirmed that the waters of the Danube River Basin are progressively becoming healthier and safer for all.

JDS4 – Discovering the Danube!

One of the most comprehensive investigative surface-water monitoring projects undertaken anywhere in the world is scheduled to start this summer.

The key objective of this fourth survey will be to gather vital data information on carefully selected water quality elements at sampling sites in 13 countries across the whole of the length of the Danube River and its major tributaries. JDS4 will harmo-

The Joint Danube Survey (JDS) is an ICPDR initiative to help Danube governments implement the Danube River Protection Convention of 1994. It is also designed to help countries meet the requirements of the EU Water Framework Directive (WFD) to ensure that rivers and lakes achieve 'good chemical and ecological status'.

nise water monitoring practices throughout the Danube countries in accordance with the WFD, thereby committing member states to achieving good water status.

The outcomes of the JDS4 should cover the information gaps deemed necessary for the 2021 update of the Danube River Basin Management Plan. The general added values of JDS4 are as follows:

- an independent basin-wide platform for improving national surface water monitoring practices
- practical joint testing and comparison of national methodologies for biological and hydromorphological quality elements leading to their future harmonisation
- an interactive platform for hands-on training for the sampling and assessment of biological quality elements
- a homogenous source of data for a number of quality elements (especially for emerging substances) for the whole of the Danube River Basin with knowledge transfer available to non-member states.

In addition, there will be a special monitoring team tasked with conducting ad-hoc and less conventional technical tests. Three particularly interesting aspects that require special monitoring include:

- effect-based methods/non-target screening (chemistry): previous surveys have been excellent examples of using effect-based analysis in combination with target chemical analysis to investigate overall contamination
- environmental DNA (eDNA) testing, which is a method to detect DNA that

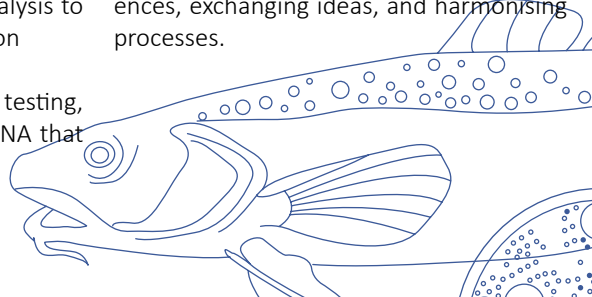
is released from an organism into the environment (in this case, the Danube)

- Microplastics: results from studies on European rivers show that plastics are ubiquitous in freshwater systems. As such data has not yet been gathered for the Danube, it is expected that JDS4 could produce an information baseline on the occurrence of plastic particles for the whole Danube.

The past three Joint Danube Surveys have been based on the principle that a Core Team of leading experts carried out all sampling, including the analysis of all biological, microbiological and hydromorphological samples, while the national experts joined the Core Team only when in their own countries and then mainly only as observers who sometimes provided assistance.

JDS4 will adopt a new approach. National authorities and individual countries will have a more active and autonomous role, with most tasks being carried by national experts. The Core Team will however continue to play a coordinating and advisory role to ensure the coherence between the approaches used by the experts from individual countries.

It is expected that this approach will lead to the development of more flexible and effective processes, and most importantly to better results. This will also enable participating countries to adopt new, innovative and bespoke solutions. It is also hoped that these combined efforts will foster coordination and improvement for the JDS, in particular with regard to sharing experiences, exchanging ideas, and harmonising processes.



An Experiment in Restoring Underwater Vegetation

An innovative project is being undertaken by the City of Vienna to increase the diversity of underwater plants in the Alte Donau (Old Danube), a recreational waterbody in Vienna that was once the main channel of the mighty Danube River.



▲ The new plants are individually planted on the floor of the lake by divers

Like many other waterbodies around the Danube in Vienna, the Old Danube is dominated by one species of underwater plant: the spiked water-milfoil. If you have ever swam in or boated on the Old Danube in summer, you will probably have come into contact with it. Spiked water-milfoil is a tall, fast-growing underwater plant with long, grass-like stems.

This plant grows to a substantial height and, when left alone, will reach and cover the surface of the water in the summer months. This causes problems for swimmers, boaters and anyone else partaking in leisure or sports activities. Additionally, this invasive species crowds out other species of underwater plants by blocking sunlight from reaching the lower depths of the waters.

The City of Vienna, Department MA 45 - Water Management manages spiked water-milfoil in and around the city by cutting it back on a regular basis during the summer months, using boats specially designed for the purpose. These small boats work on the same basis as the lawnmower used to cut the grass in gardens

and parks and is capable of manoeuvring into difficult spaces to collect the cuttings for removal. The milfoil is cut back in popular areas to a height of 2.5 meters below the surface to prevent the plant from interfering with recreational activities. The cuttings are then collected and turned into organic compost that is made available to the public at waste collection and recycling centres around Vienna. Cutting back, rather than removal, is preferred because the plant helps to balance nutrients and keep the waters of the Danube clean and oxygenated.

Controlling this somewhat troublesome plant is expensive and requires substantial manpower and resources. For this reason, the City of Vienna has started an initiative to reintroduce a less problematic species of plant to the Old Danube. In spring 2017, divers planted seven low-growing stonewort species of underwater plant on a surface covering 2.5 hectares of the lake floor. Stoneworts are native to the Danube region and were once the dominant plant in the Old Danube. The bed is protected from grazing fish by a net, but the area can still be used by swimmers and boaters. The

In medieval times, the Old Danube was the sprawling main channel of the Danube. Centuries of regulation mean that it is no longer essential to the trade, transportation and prosperity of the city of Vienna. Long since cut off from the River Danube itself, the Old Danube has a new purpose as a recreational waterbody for the people of Vienna to relax in and around.

protective net will be removed in 2020 and it is hoped that the stonewort species will once again thrive and eventually cover a substantially larger area of the lake bed in the Old Danube.

The proliferation of the stonewort species will provide several important benefits. First, ecological diversity generally makes an area more resistant to environmental pressures and changes. For example, if the water quality is altered and the lake or its parts become inhospitable to spiked water milfoil, the existence of other species could be critical in ensuring the continuation of necessary biological and ecological functions. Moreover, stoneworts are low growing plants that could provide the benefits of submerged plants without the inconvenience of having to carry out expensive and time-consuming management and maintenance measures.

On Department MA 45's website at www.gewaesser.wien.at

We recently spoke to **Dr. Thomas Ofenböck**, a specialist in limnology at the Municipal Department MA 45 - Water Management. He was project manager for the EU project LIFE+ Alte Donau, which was completed in 2018.



The Old Danube is popular for swimming, boating, and other recreational activities. The project is reintroducing alternative species of underwater plants native to it by planting them on the lake bed and providing temporary protection that enable the plants to thrive. The rapidly-growing millfoil covers the surface of the water and therefore needs to be cut back regularly.

“ Danube Watch: Where did the idea for the project come from?

Before the problems with water quality in the 1990s, various Characean species dominated the underwater plant population in the Old Danube. However, as water quality deteriorated, the underwater plants almost completely disappeared, as did the characeae.

When the water quality improved again after the remediation of the Old Danube, the tall spikewort (*Myriophyllum spicatum*) became particularly dominant, while the characeae practically disappeared. In the still cloudy water, the spikewort had the advantage of being able to grow closer to the surface and thus to the light.

The strong and rapid growth-rate of high-growing species in the flat areas of the Old Danube was extremely detrimental to recreational use, which is why attempts were soon made to plant low-growing characeae, otherwise known as stonewort. It turned out that although the characeae grow very well, they are quickly eaten by fish while they are still in the small growth

stage. It therefore became obvious that larger areas needed to be planted that were protected from fish.

Danube Watch: How did you first get involved in the project?

I was involved in the planting project as project manager of the five-year EU LIFE project for the Old Danube, which has since been completed. This project aimed to improve the resilience of the Old Danube to the ever-increasing pressures of usage and other stress factors. Amongst other things, a strategy to ensure the biodiversity of aquatic vegetation and the promotion of low-growing underwater plants was developed in order to reduce the need for the regular,

long-term cutting back (mowing) of spike-wort. The opportunity presented itself to create an area with characeae that was large enough to withstand feeding pressures from fish. In 2017, a large area on the Lower Old Danube (near Strombucht) was planted with low-growing Characean species.

Danube Watch: Where did the plants come from? Did you harvest them from elsewhere in the Danube?

The plants come from a rearing pond owned by a contractor for the City of Vienna that already has a lot of experience in this area. Only those species were used which had proved their worth in the run-up to the trial planting in the lake. This company was also responsible for providing divers for planting the new species on the bed of the lake.

Danube Watch: Was the project monitored throughout 2018 and what have been the results?

Yes, regular diving activities have taken place to inspect the site and document

the development of the plants. The results are extremely positive: the characeae have developed very well and are forming extensive cover on the lake bed. During the course of the diving, small care measures are also undertaken, such as the removal of milfoil plants found to be growing between the characeen.

Danube Watch: Are there plans to do more? Are there plans to expand the project to other rivers or lakes?

The planting measures in the Old Danube are to be expanded. This is a waterbody with an area of 150 ha, yet so far only 2.5 ha have been planted. Even if the characeen continue to spread independently throughout the lake, as is hoped, there is still much to do here. Concrete plans for planting stoneworts in other waterbodies belonging to the City of Vienna do not currently exist.

Danube Watch: Is there an aspect of the project you find particularly interesting?

It was very interesting that the experiments showed that certain fish species, especially rudd (*Scardinius erythrophthalmus*), feed on characeae quite deliberately, a fact that we were previously unaware of. This has also led to the need to keep the stock of herbivorous fish species in the planting area as low as possible.

Danube Watch: Are there important partners that you would like to acknowledge or thank for helping?

Special thanks go to the Austrian Fisheries Society, which supported the action as a fishing tenant of the Old Danube and actively supported the measures.

Robert Ives, is a freelance journalist and translator who also works as a lecturer at the University of Vienna. He is the editor of Danube Watch

Eric Arbizo, is a practicing lawyer in New York passionate about the Danube River.

Danube Watch – Interview with Walter Binder

Walter Binder has devoted his life to enhancing the ecological status of rivers and returning them to their natural states. A landscape planner with more than 35 years' experience, he worked on the first pioneering river renaturation projects in the 1980s, developing a model for the creation of near-natural rivers that is still widely used today. We spoke to him recently and asked him about his life, his inspirations and his work as an advocate for river restoration.

PEOPLE
OF THE DANUBE

In the interview series "People of the Danube", Danube Watch presents personal portraits of individuals who are passionate about the Danube Basin and its waters.

Danube Watch: Mr. Binder, how would you describe your personal relationship with the Danube and the Danube catchment area and what is your favourite spot on the river?

The Nibelungen Saga, the Danube 'Schachteln' (small boats with box-shaped cabins) with which the Swabians from Ulm travelled the river more than 200 years ago to settle on the Lower Danube, and also the stories of men in folding kayaks ('Faltbootfahrern') who journeyed down the Danube to the Black Sea impressed me when I was a child. Later in my career I got to know the Bavarian Danube with its different tributaries in North and South Bavaria better. The great variety of landscapes in the catchment area of the Danube and its inhabitants still fascinates me today. To visit them is always a special experience for me.

My favourite places on the Bavarian Danube are the floodplains between Neuburg and Ingolstadt, the Danube Gorge at the Weltenburg Monastery and the floodplains where the Isar flows into the Danube (and the neighbouring beer gardens of course), along with the historic cities on the Danube such as Ulm, Regensburg and Passau.

Danube Watch: What is your professional background? How did you come to become a specialist and advocate of river renaturation in Bavaria?

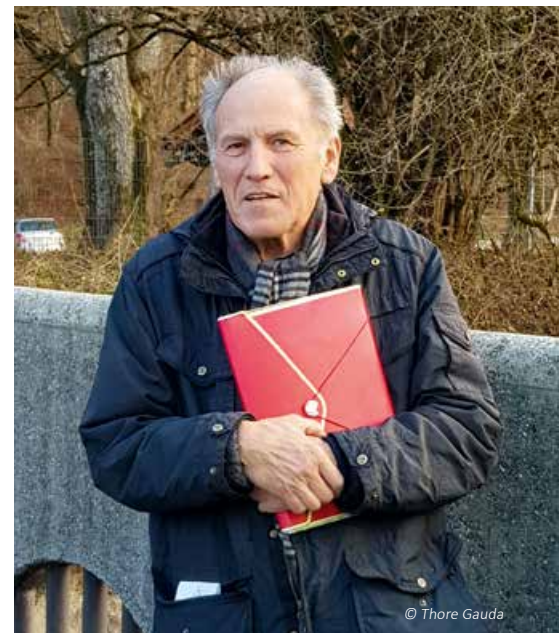
I have worked as a landscape planner for more than 35 years in Bavaria, working on

the ecological enhancement of rivers obstructed by man-made constructions. The focus was initially on the protection and conservation of river sections that were still largely near-natural. In the 1980s the first projects to restore developed river sections were carried out, with the objective of returning ecologically poor river sections and their floodplains to their former natural states.

The model for such renaturation projects is to focus on river sections that are still by and large natural. This model was developed by river morphologists, water biologists and conservationists and affords more freedom for waters to flow naturally through the removal of embankments and the provision of more natural space.

Such projects facilitate the development of natural waterbody structures and make an important contribution towards the renaturation of rivers and floodplains. They improve the range of natural waterbody structures and habitats for animals and plants and provide recreational areas for humans. They also support the requirements of the European Water Framework Directive to achieve its objective of achieving good or very good status for waterbodies.

In the beginning, the first task was to overcome resistance to such an approach on the part of hydraulic engineers, stakeholders and the general public who were initially unaware of such methods. However, the first projects met with broad approval among the population and set the benchmark for future projects.



Danube Watch: Can you tell us why your story (e.g. on the Isar in the Mühlthal) has been so successful and why other countries in the Danube catchment area should follow your example?

The success of the renaturation projects, not only in the urban areas of Munich, but also to the south of the city at the Mühlthal power plant, had as their guiding principle the restoration of the river landscape by reinstating hydromorphological processes. Objectives were set to improve flood protection, ecological conditions and recreational use. The river sections with their extensive gravel banks that have been renaturalised there have given the Isar back its alpine character and a certain sense of tranquility.



A decisive factor in the success of these river renaturation projects was both the good water quality of the Isar and also the trusting cooperation between experts and stakeholders from the fields of hydraulic engineering, hydropower, nature conservation and the environmental associations who have joined forces to form the Isar Alliance. In addition, the public was also involved from an early stage.

Today, the restored river sections are attractive recreational destinations that are visited by great numbers of visitors on warm days. This leads to pollution from rubbish and also to disturbance of sensitive habitats, e.g. bird species breeding on the gravel banks. An attempt is therefore being made to preserve the attractiveness

of the renaturalised river landscape by informing visitors how they can prevent adverse effects on the natural balance.

Danube Watch: *Finally: What advice can you give us as people living alongside the Danube?*

Near-natural rivers with their floodplains are the ecological backbone of our landscapes. They are home to a large number of habitats for plants and animals and are of great importance for the conservation of biodiversity. Hydraulic engineering projects such as flood protection and the construction of hydroelectric power plants, the intensification of land use in the floodplains and the construction of settlements and traffic infrastructure have constricted

many river sections and led to them becoming ecologically impoverished.

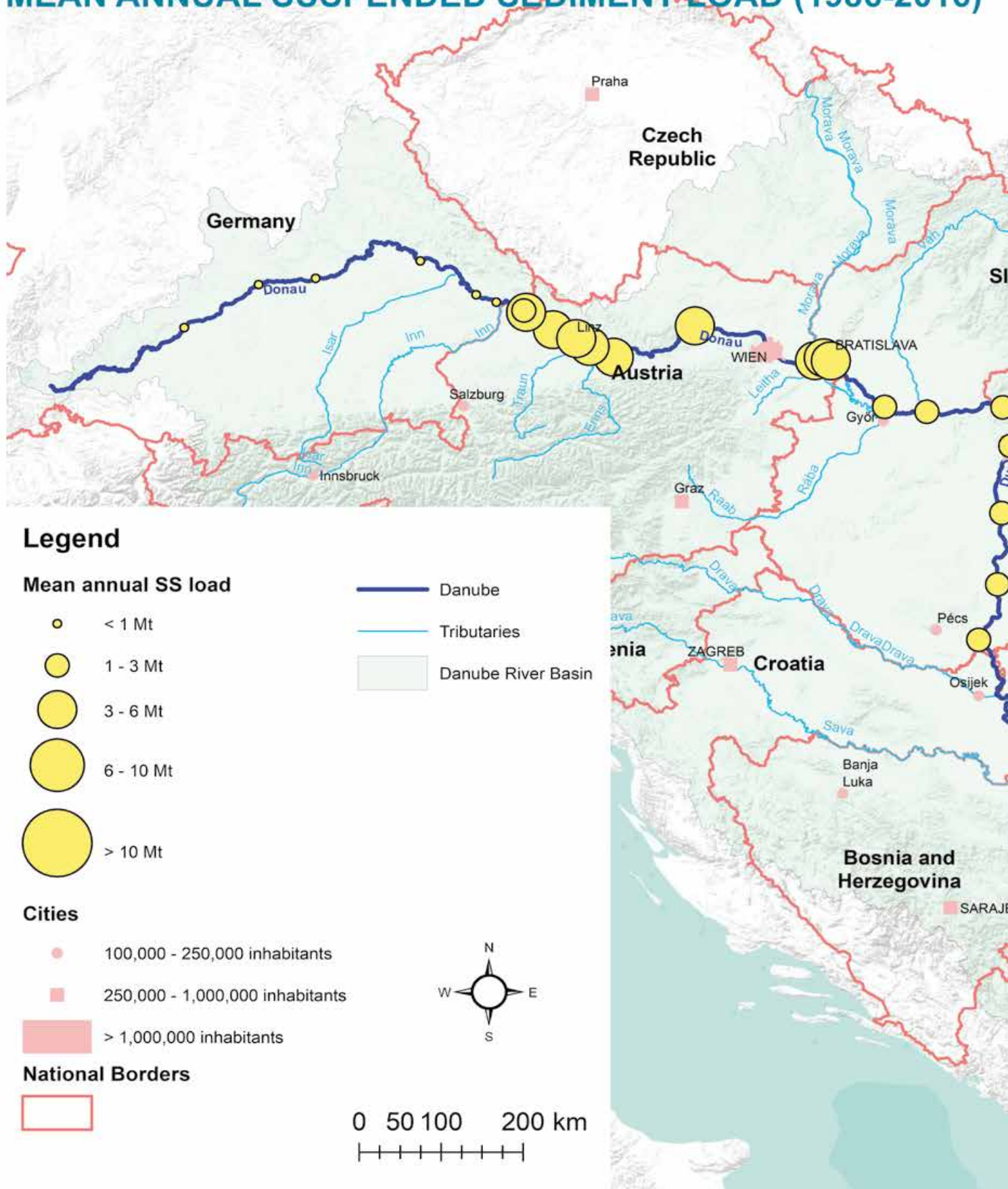
The aim must be to preserve and protect river landscapes that are still close to their natural state and, wherever possible, to enhance obstructed and ecologically impoverished river sections in order to counteract the loss of habitats for animals and plants and to secure recreational areas for the future. An essential prerequisite for this is to provide the river with a sufficient corridor to its floodplains, within which it is free to run its course. ”



Fold out
to see a map of the Danube's
suspended sediment hotspots.

Suspended sediment monitoring stations along the Danube

MEAN ANNUAL SUSPENDED SEDIMENT LOAD (1986-2016)





<http://www.interreg-danube.eu/approved-projects/danubesediment>

Information provided by Contracting Parties (AT, BG, DE, HR, HU, RO, RS, SK).



**ICPDR – International Commission
for the Protection of the Danube River**

Secretariat, Vienna International Center, D0412, P.O. Box 500,
1400 Vienna, Austria, Tel: +43/1/260 60-5738, Fax: +43/1/260 60-5895
e-mail: secretariat@icpdr.org, www.icpdr.org