

DANUBE WATCH

3/2020

THE MAGAZINE FOR THE DANUBE RIVER
WWW.ICPDR.ORG



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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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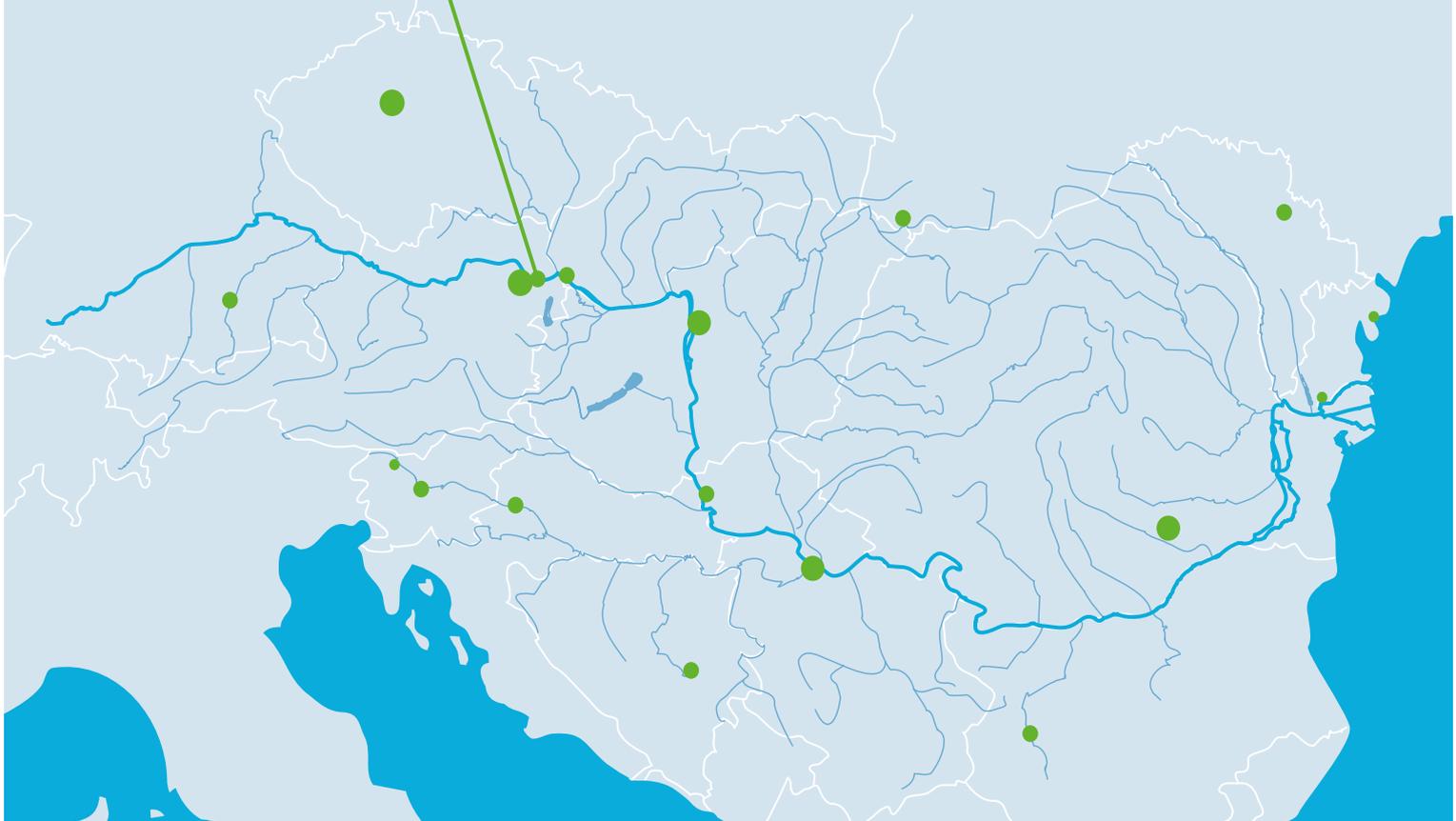
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Dear readers,

For most of us, the last 15 months have been associated with radical changes in our everyday lives. Home schooling and home office, video calls instead of family visits... the COVID-19 pandemic has revealed both weaknesses and opportunities within our societies. Despite the many restrictions, modern communication channels have helped us to keep in touch. We humans are social beings. Many of us have realised how important communication is to us!

For international river protection commissions such as the Danube and Rhine commissions, not to mention all associated national and NGO experts, the pandemic massively interfered with day-to-day activities. Our entire working structures were built around physical meetings. From one day to the other, travelling to international meetings became impossible; the interpreters booths were suddenly empty. When we realised the pandemic was going to last more than a few months, we soon established new ways of communication. Although we're looking forward to the time when we'll be able to meet again, videoconferences have become a daily routine – some of them with online simultaneous interpretation!

The pandemic, which stems from a zoonosis, but also severe weather events like the 2018 drought in Central Europe or the 2014 floods in south-east Europe, often seen as heralds of climate change, make us reflect on

the way we treat nature. "Blue" natural resources such as rivers, lakes and wetlands are especially sensitive. The countries in the Danube and Rhine River basins are making continuous efforts to improve the ecological situation. River continuity, elimination of sources of pollution and flood prevention are some of the most prominent issues we're concerned with.

Despite the difficult conditions, both my own commission – the International Commission for the Protection of the Rhine (ICPR/IKSR) – and the ICPDR, have published their draft International River Basin Management Plans and Flood Risk Management Plans on www.icpdr.org and www.iksr.org. Now, dear readers, it's your turn to have your say and you're invited to do so in your mother tongue! Both instruments, which describe the current ecological situation and the measures for further improvement, are available for online consultation in 11 languages in the case of the Danube and 3 languages in the case of the Rhine. As citizens of our basins and local experts on our rivers, your feedback is much appreciated!

To reiterate my initial statement: communication is vital, and we at the ICPR, have identified it as a top priority. We believe in the importance of reaching out to the general public via new communication channels. The ICPDR with its activities on social media has been a role model for us. I am, therefore, proud to share that the Rhine Commission has opened a new Twitter account (@ICPRrhine). I think I can speak for both commissions when I say: Follow us on social media, stay in touch with us, comment on the results of our work! We're looking forward to it!

Marc Daniel Heintz, is the Executive Secretary of the International Commission for the Protection of the Rhine (ICPR).

ICPDR **IKSD**

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

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News & Events

ICPDR's Ordinary Meeting Held Despite Pandemic

On the 15th and 16th of December, 2020 – The annual Ordinary Meeting took place this year with many vital topics addressed by those in virtual attendance.

Due to the COVID-19 outbreak, the 23rd ICPDR Ordinary Meeting was held via an online Zoom conference with all contracting Parties able to attend the meeting. The Chairpersons of the RBM EG, FP EG, MA EG, PM EG, IMGIS EG, APC EG, PP EG and ad hoc S EG also participated. Many of the accredited observers attended the online meeting as well.

The Session was particularly devoted to the budgetary situation and ICPDR administration, discussion on the work of the Expert Groups, the preparation of the Danube Flood Risk Management Plan Update 2021 and the Danube River Basin Management Plan Update 2021 (see more on page 5) and international cooperation, partnerships and projects.



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This year's Ordinary Meeting showed that even in extenuating circumstances, the work of the ICPDR will not be put on hold. It also continued to highlight a central concept of 2020: we can achieve a great deal digitally that would otherwise have been done in person.

Danube Art Master 2020 Winners Announced During ICPDR's Annual Ordinary Meeting



© Danube Art Master

VIENNA, 16th of December, 2020 – The environmental Art competition, “Danube Art Master” is delighted to have received a surprisingly large number of artworks submitted in 2020, despite taking place under truly exceptional circumstances.

In the “Art” category, “Laubfisch” (Fish Made of Leaves) by the 3b class of Pestalozzistraße Primary School in Ingolstadt, Germany (Juniors); “U zagrljaju Dunava” (In the Embrace of the Danube) by the 7th and 8th graders of Stefan Nemanja Elementary School in Niš, Serbia (Teens).

In the “Video” category, Serbia’s winning video, “Dunavski ekosistemi” (Danube Ecosystems) was made by Jacopo Marazzi and Ilija Marazzi from Belgrade (Juniors); Simona Petrova and Eva Marinova from the IX. class of Prof. Dr. Assen Zlatarov Vocational School in Vidin, Bulgaria won the best video with “The Danube River” (Teens).

In the “Map” category, “Impreuna pentru dunare” (Together for the Danube) by Maria-Delia Dima from Paul Bujor Elementary School in Berești, Romania (Juniors) and “Prut River - Treasure of Moldova” by Iasmina Costileanu from Mihai Eminescu High School in Cahul, Moldova (Teens) were the winning selections.

A special COVID category rewarded contestants from countries in which the pandemic was so bad they could not participate in DAM 2020 as they otherwise would have. In this category, the video “Danes za lepši jutri” (Today for a Better Tomorrow) made by 7th graders Žana Bartolj and Ajda Jamšek of Tržišče Elementary School in Slovenia, received the most points from the international jury.

Rural Wastewater Workshop: Beyond Utility Reach?



On the 19th and 20th of January, 2021, the ICPDR co-hosted an online workshop on rural wastewater management with the World Bank and the Danube Water Program.

For most of the countries in the Danube region, managing wastewater remains an important challenge to reach water resources protection targets, especially in the context of EU accession and harmonisation processes. In many rural communities of the Danube region, adequate sewage collection systems and

treatment facilities remain a critical issue often caused by the lack of financial, technical and staff resources. The lack of awareness in Danubian society is another additional issue. However, Goal 6 of the Sustainable Development Goals (SDGs) underlines commitments to achieving universal access to water services for all by 2030.

This workshop followed up on several initiatives related to rural wastewater management in the Danube Region, under the auspices of the World Bank, Danube Water Program and the ICPDR. It aimed to contribute to understanding and awareness of this issue, and to create an enabling framework for sustainable and decentralised solutions for wastewater treatment in rural areas. The workshop focused on issues of wastewater management in smaller agglomerations, with an emphasis on decentralised sanitation and wastewater treatment systems in rural areas, and individual and low cost solutions. It brought together policy makers, government and utility representatives, academia, consultants and international institutions engaged in field of rural wastewater.

ICPDR Ready for First Fully Online Public Consultation Process

Following the 23rd ICPDR Ordinary Meeting on the 15th and 16th of December, 2020, the updates to the Danube River Basin Management Plan (DRBMP) and Danube Flood Risk Management Plan (DFRMP) scheduled for 2021 are continuing.

The drafts of the DRBMP and DFRMP 2021 updates submitted for approval to the Contracting Parties via written procedure were ready for publication for the 31st of March, 2021 deadline.

This signaled the launch of the all-important public consultation process. This process will span a six-month period, coming to a close in September, 2021. During this time, the public will have a variety of opportunities to give comments and offer observations on the nature and specific text of the DRBMP and DFRMP updates.

- ◆ Firstly, the public will be able to get in touch via a dedicated email address: wfd-fd@icpdr.org.
- ◆ Secondly, the public will be invited to fill in an online questionnaire offering their insights into some of the key sections of both plan updates.
- ◆ Thirdly, the Our Opinion- Our Danube public consultation event will take place on 29-30th June 2021.



While the event was initially planned as an in-person event to be held in Budapest in Spring 2021, current pandemic circumstances have necessitated a shift to the virtual sphere. This means that Our Opinion- Our Danube 2021 will be the first online event for public consultation of the DRBMP and DFRMP updates, potentially enabling a broader audience than ever to let themselves be heard.

Copernicus and the Power of Knowledge

In the fight against climate change, the battle of information is key. With so much climate change denial disinformation saturating all aspects of discourse and originating from sources at levels, accessibility to clear and authoritative information based on data and fact is priceless. This is where the Copernicus Climate Change Service (C3S) offers an invaluable solution by providing authoritative information about the past, present and future climate in Europe and the rest of the world.

C3S supports European Union climate change adaptation and mitigation policies by providing consistent and authoritative information about climate change itself, thus allowing for better decision-making. This support comes in the form of free and open access to scientifically-based climate data and tools which allow users meet their goals in dealing with the impacts of climate change.

C3S is one of six thematic information services provided by the Copernicus Earth Observation Programme of the European Union, and, as such, is an operational programme that builds on existing research infrastructures and knowledge available in Europe and around the world. The information provided by C3S is based largely on climate research carried out within the World Climate Research Programme (WCRP) and acts as a response to user requirements defined by the Global Climate Observing System (GCOS). Copernicus also acts as an important source of climate change information for the Global Framework for Climate Services (GFCS).

The operation and implementation structure of C3S is important to the assurance of the independent scientific validity of its data. Copernicus is implemented by the European Centre for Medium-Range Weather Forecasts (ECMWF), an independent intergovernmental organisation, on behalf of the European Commission.

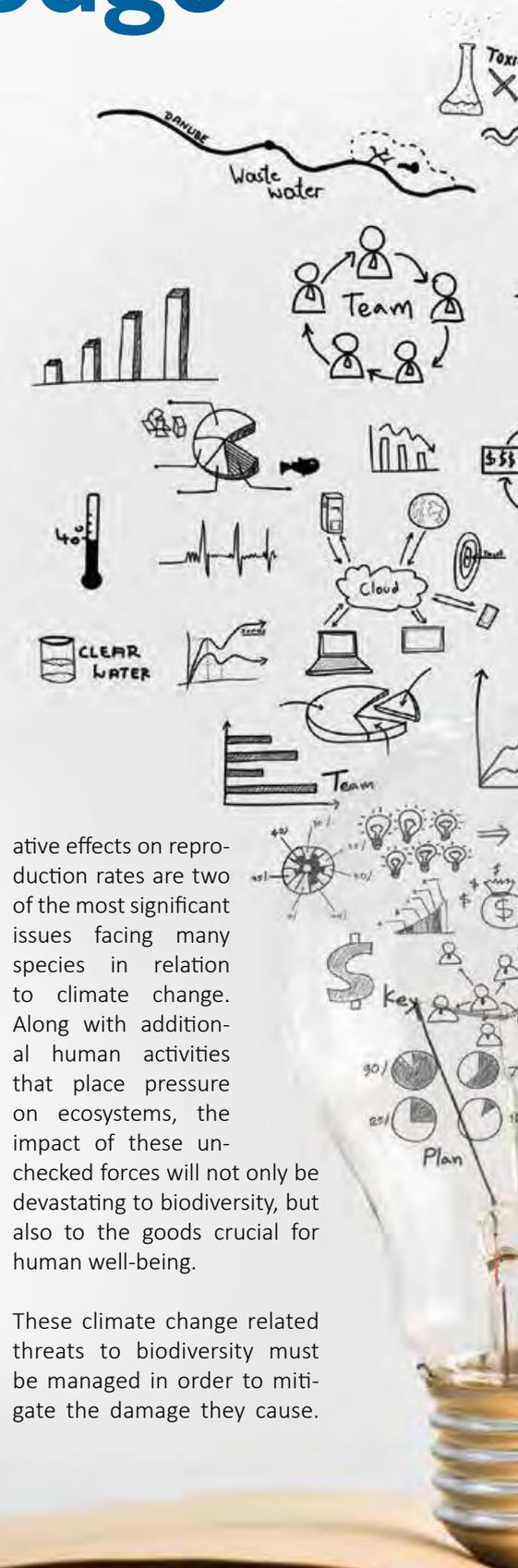
In the end, the ECMWF and the European Commission both serve their Member and Co-operating States and the broader community, thus setting in place a level of answerability that helps to ensure the integrity of all C3S data. The majority of C3S service elements, in turn, are implemented by about 260 companies and organisations across Europe, which are selected based on competitive Invitations To Tenders (ITTs). An essential service element is the availability of climate impact data and information on a range of topics and sectoral areas through their Climate Data Store (CDS) which is designed to enable users to tailor services to more specific public or commercial needs.

The work of the Copernicus Climate Change Services acts to complement the array of meteorological and environmental services that already exist in most European countries. C3S is able to derive the most benefit in the implementation of its services by using pre-existing infrastructure and knowledge through the involvement of national climate service providers and academic communities.

Keeping the public and stakeholders up to date with advancements and developments to climate adaptation services is seen as being of the utmost importance. As such, many meetings and workshops, including an annual General Assembly, are held by C3S in order to inform the relevant parties. These meetings also allow members of the climate change community to join networking and brainstorming sessions to contribute to future developments of C3S. These meetings, combined with technical support and training to users of the CDS create opportunities for enhanced usage and understanding of the wealth of information offered by Copernicus.

Biodiversity

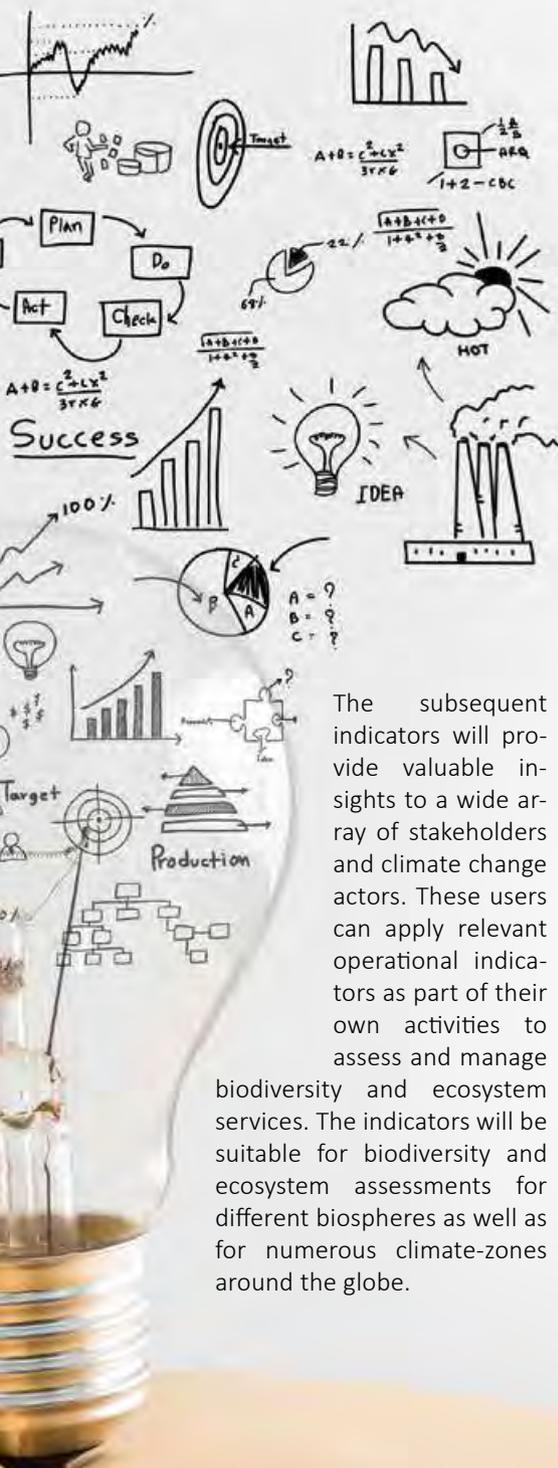
Climate change poses the greatest threat to global biodiversity. Habitat loss and neg-



ative effects on reproduction rates are two of the most significant issues facing many species in relation to climate change. Along with additional human activities that place pressure on ecosystems, the impact of these unchecked forces will not only be devastating to biodiversity, but also to the goods crucial for human well-being.

These climate change related threats to biodiversity must be managed in order to mitigate the damage they cause.

Ecosystem restoration and species dispersion measures are just two examples of potential management schemes. However, readily accessible information about the current and future climate is critical to the success of such measures, and is often lacking. The climate-biodiversity indicators developed within the C3S Biodiversity service can contribute to assessing the impact of a large number of variables on habitat suitability, species distribution, species fitness and reproduction and ecosystem services.



The subsequent indicators will provide valuable insights to a wide array of stakeholders and climate change actors. These users can apply relevant operational indicators as part of their own activities to assess and manage biodiversity and ecosystem services. The indicators will be suitable for biodiversity and ecosystem assessments for different biospheres as well as for numerous climate-zones around the globe.

Operational Service for the Energy Sector

The C3S Energy operational service seeks to provide key information for climate-related indicators relevant to the European energy sector. This includes data in terms of electricity demand and the production of power from renewable sources. Already over the past year, the core work of the C3S Energy operational service has been the production of climate indicators in three main streams. These are historical, seasonal forecasts and projections.

The continued delivery of the C3S Energy operational service is expected to provide widespread opportunities extending beyond Europe, solidifying the Copernicus Climate Change Service's world-leading, international reputation.

Agriculture and Forestry

As agriculture and forestry will also be greatly affected by climate change, especially regarding food production, C3S provides data to help the agri-forestry sector to predict how these changes will affect crop yield, and, ultimately, return on investment.

Operational Service for the Water Sector

This service aims to help a broad range of water managers to adapt their strategies in order to mitigate the effects of climate change. The targeted fields include water allocation, flood management, ecological status and industrial water use. It offers an interactive web application with refined data, guidance and practical demonstrations for water managers across Europe, with the intent of advancing climate-change adaptation through the utilisation of seasonal forecasts and climate-impact indicators.

In order to provide as much information and aid to policy makers in making their climate impact assessments, a comprehensive overview for Europe is available along with the possibility for consultations with engineers. A user network sharing experience for climate adaptation during annual assemblies is also available to users. This provides:

- ◆ maps and graphs, showing multi-model ensemble data of water and climate,
- ◆ time series to download, with future river flow and water-related indicators,
- ◆ high-resolution harmonised datasets for the whole of Europe,
- ◆ bias-adjusted data from model ensembles,
- ◆ quality-assured data with confidence estimates,
- ◆ real-life examples of decision making in climate adaptation.

Clearly, the goal of Copernicus Climate Change Service is to make as much valuable climate change data available as possible. Importantly, however, it is not simply the data that is being made available, but also the relevant expert interpretation of this information as well as expert guidance regarding the shaping of policies for everyone from government agencies to private businesses to NGOs. If knowledge is power, then C3S is helping to make us all stronger in the face of climate change.



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- ▮ **For more information**, please consult the Copernicus Climate Change website at <https://climate.copernicus.eu/>
- ▮ In case of specific technical questions and requests for collaboration, please contact the Copernicus User Support team at copernicus-support@ecmwf.int
- ▮ If you are interested in learning more about the work Copernicus are doing to gather user needs for climate information in the Danube River Basin, please contact **Rosie Oakes** – rosie.oakes@metoffice.gov.uk and **Stjin Vermoote** – vermoote@ecmwf.int



Public Participation within the Legal Setting of EU's Water Framework Directive and the Floods Directive

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 as well as the public 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 (WFD) along with Articles 9 and 10 of the EU Floods Directive (FD).

In its pursuit of sustainable transboundary river management and effective flood risk management in the Danube River Basin, the ICPDR continues to improve and protect a high level of water quality throughout the region. All of this work began back in 1994 with the signing of the Danube River Protection Convention, but also includes the EU Water Framework Directive (2000) and the EU Floods Directive (2007).

The ICPDR develops such plans, which emphasise public participation, at 6-year intervals: a River Basin Management Plan and a Flood Risk Management Plan for the Danube River Basin. These plans aim to implement the legal requirements of WFD and FD, comprising strategic guiding plans for water management over the course of six years. Both are to be developed with a range of public consultation measures which lie at the core of the ICPDR's central work programmes and, as such, should be developed with the strong involvement of

civil society and stakeholders from the beginning via public participation events such as workshops. As the culmination of our six-year management cycle, the ICPDR is currently developing its Danube River Basin Management Plan and Danube Flood Risk Management Plan Updates 2021, which will guide activities throughout the Danube River Basin from 2021 to 2027. These plans aim to make the waters of the Danube River Basin cleaner, healthier and safer. They will further protect and enhance the status of all waters and ensure the sustainable, long-term use of water resources as well as the sustainable management of flood risks.

For the development of the management plans, representatives of civil society and stakeholders are called upon to contribute their views, give us their opinions and have their say. The people of the Danube River Basin will be affected by the measures following the plans for generations to come and, therefore, are given an opportunity to have a word on their development from the beginning.

Recently, through an increased awareness of environmental issues, a growing appreciation for the ways in which the environment affects public health, and the more direct contact of social media, public participation in these processes is very much on the rise. The ICPDR is taking this opportunity to further open its doors and mechanisms to invite the public to participate in a variety of ways – and the public is growing increasingly engaged as a result. 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. A 'bottom-up' approach today 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. The increasing number of ways in which the public can be reached is useful for broadening our methods and putting together a new approach for engaging the public, exploiting rising awareness in order to facilitate broader support for our activities and policies and greater efficiency in their effective implementation.

Hélène Masliah-Gilkarov is the ICPDR's Technical Expert for Public Participation & Communication and Executive Editor of Danube Watch

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 activities such as the Danube Art Master competition) 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 and the ICPDR social media platforms 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.



The ICPDR supports the active involvement of stakeholders and civil society at all levels of its work. This is pursued through observer organisations, as well as through public consultation activities for the development of management plans. To ensure a high level of public information, educational and outreach initiatives support the public participation work of the ICPDR.



March 31st, 2021, the Danube River Basin Management Plan and Danube Flood Risk Management Plan Update 2021 were published for public consultation. Comments can be sent until 30th September, 2021. They will be taken into account during the review and finalisation of the plans, ending in December, 2021.

The DanubeSediment Project: Upping Stakeholder Know-how

The involvement of stakeholders has always been a vital aspect of the work of the ICPDR. Recently, however, the drive to expand this involvement even further has been placed front and centre. To this end, numerous projects organised and executed by partner organisations along with the ICPDR have contained a heavy emphasis on stakeholder involvement. This was done, for example, through workshops that supported the transfer of knowledge to key target groups throughout the Danube River Basin, including in the fields of hydropower, navigation, flood risk management and river basin management, including ecology. These target groups were also involved in the development of the project results, such as within the framework of national events.

Strengthening Stakeholder Involvement

One main project output is the Danube Sediment Management Guidance, or DSMG ¹. It contains recommendations for reducing the impact of a disturbed sediment balance. As an example, this could apply to the impact on the ecological status and on flood risk along the river. Vitality, by feeding into the Danube River Management Plan (DRBMP) and the Danube Flood Risk Management Plan (DFRMP) published by the ICPDR, the project makes a direct contribution to transnational water management and flood risk prevention. It is also worth noting that Sediment Balance Alteration became a (sub) SWMI (Significant Water Management Issue) in the 2021 Update of the DRBMP.

To further the acceptance of any sediment-related management measure, all relevant stakeholders should be included in the planning phase. With their expertise, the feasibility of a measure can be analysed and adopted to site-specific conditions. With this in mind, stakeholder

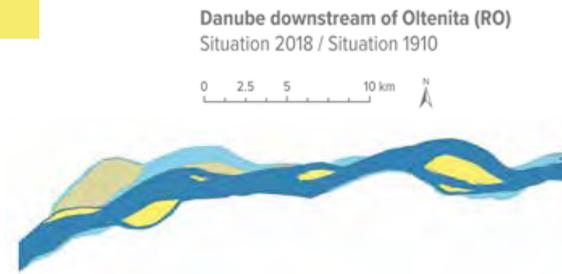
One such example of this stakeholder involvement-focused concept has recently been completed under the auspices of the DanubeSediment project. The ICPDR identified sediment regime change in the Danube River as an issue more than a decade ago. Sediment is a natural part of aquatic systems. Over the centuries, humans have strongly altered the Danube River, with riverbed straightening, hydropower dams and dikes have led to significant changes in the sediment load. The resulting sediment imbalance contributes to flood risks, reduces navigation possibilities and hydropower production. It also, importantly, leads to the loss of biodiversity within the Danube Basin.

Because the Danube flows through ten countries, a transnational project on sedi-

ment management was needed to put together a full and thorough picture of the issue at hand. In order to best tackle this issue, improvements to sediment and water management as well as the morphology of the Danube River need to be undertaken. Nearly four years ago, 14 project partners and 14 strategic partners came together within the DanubeSediment project to accomplish this goal. The DanubeSediment project also brought together a number of sectoral actors, higher education institutions, hydropower companies, international organisations and non-governmental organisations from nine Danube River Basin countries.

workshops were implemented at different stages of the project as well as personal consultations with the project partners. These supported the transfer of knowledge to key target groups throughout the Danube River Basin including the hydropower and navigation industries, waterway authorities, environmental organisations (e.g., national parks), NGOs, the scientific community and flood risk and river basin management groups, which includes ecology experts.

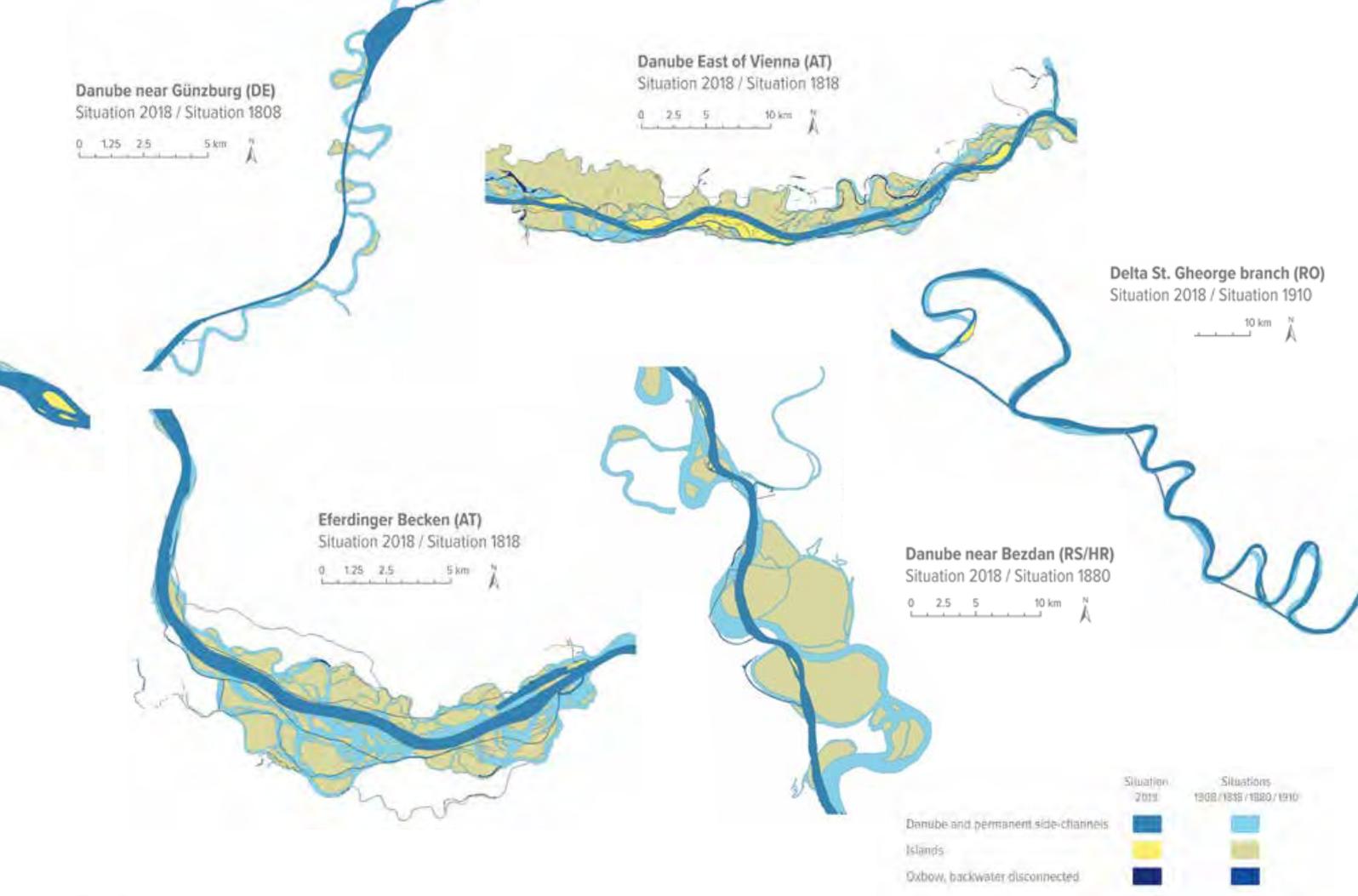
These target groups were also involved in the development of the project results, such as within the frame of national events. The project also specifically addresses the key target groups and their roles in its second major output: The Sediment Manual for Stakeholders or SMS ². The SMS offers assistance for sediment-related actions in the Danube River Basin and for future programmes of sediment-related measures. The document also provides background information and concrete examples for



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implementing good practice measures within each field which can support decision-makers and practitioners in planning future sediment management measures. The DSMG and SMS can form the basis for a potential follow-up project on a concretisation of sediment management by e.g., pilot measures. The project also created two videos and interactive maps to aid in the visualisation of these project results and recommendations.

Upon the recent completion of the sediment project and the subsequent Sediment Manual for Stakeholders, the DanubeSediment team transferred its stakeholder contact list to the ICPDR. This contact list has already been incorporated into ICPDR's existing stakeholders list and will allow the ICPDR to better expand and deepen its mission of stakeholder involvement in projects in all areas that concern the well-being of the Danube River Basin.



The Project

In order to better understand the risks and impacts of sediment surplus and deficit, the project analysed the most important drivers and pressures causing alterations to the balance of sediment. Based on data collected by the project team, a sediment balance was created that analysed the sinks, sources and redistribution of sediment within the Danube. Based on a comparison of the various monitoring methods and instruments that were used to collect sediment data by numerous Member States, the project was able to recommend the establishment of a harmonised quantity monitoring network, the setting up of new monitoring stations and the creation of a centralised data storage location.

Overall, the project results confirmed the assumption that there is a tendency toward sedimentation in the impoundments when the river is dammed, while erosion mainly

occurs in free-flowing river sections. One result of the sediment regime analysis was the observation that since the construction of major hydropower plants, the (suspended) sediment transport decreased at the Danube itself but also at the tributaries due to sedimentation in reservoirs and impoundments (together with a bedload continuity interruption) leading to riverbed erosion in the free-flowing sections. The total suspended sediment input to the Danube Delta and the Black Sea decreased by more than 60%. This means that the suspended sediment load decreased from previous amounts of about 40-60 megatons per year to approximately 15-20 megatons per year currently, contributing to coastal erosion of up to 24 m per year.

To calculate the entire sediment balance of the Danube, the project partners also analysed bathymetrical data, bed material

as well as dredging and feeding. In total, about 733 river kilometres (29%) of river length analysed is dominated by erosion. In the Lower Danube, 670 kilometres (27%) show a trend toward erosion, however, a lack of data hinders any detailed analysis, meaning that local sedimentation may exist in stretches of general riverbed erosion. When this is added up, more than half of the Danube River shows a tendency toward erosion, while 857 river kilometres (34%) are dominated by sedimentation, especially upstream from the major hydropower plants Aschach, Gabčíkovo and Iron Gate I. Only around 10% of the analysed river stretch (i.e., 241 kilometres) show a dynamic balance between sedimentation and erosion respectively no significant changes occurring.

For more information, on DanubeSediment's projects see: www.interreg-danube.eu.

- Habersack H., Baranya S., Holubova K., Vartolomei F., Skiba H., Babic-Mladenovic M., Cibilic A., Krapesch M., Gmeiner Ph., Haimann M. (2019a). 'Danube Sediment Management Guidance', Output 6.1 of the Interreg Danube Transnational Project DanubeSediment co-funded by the European Commission, Vienna.
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Maps as Ti

We here at the ICPDR love maps. Maps provide an elevated level of understanding. They can make complicated data appear as clear to a layperson as it is to the expert who compiled the data in the first place. This is the reason why the ICPDR creates so many maps. Danube Watch has highlighted in recent issues the process, and great effort put therein, necessary to create the ICPDR's dozens of maps out of numerous datasets. Our own Zoran Major, Technical Expert for GIS and cartographer extraordinaire, explained the process expertly and with passion. (The article can be found in Danube Watch 1/2020, and is well worth the read!)



One of the most interesting ways that maps can help us understand the world around us is comparison. The ability to compare data that is reflected on what would otherwise be the same map is a valuable tool indeed. When it comes to the Danube River Basin, one could simply consult the vast array of ICPDR-created maps and have a wonderfully well-rounded idea of the many issues threatening the Basin, the ins and outs of the Basin's form and structure and many other aspects as well. To have a genuinely full conception of the Danube River Basin, however, requires the use of a time-machine, or the next best thing.

The past can be a tricky thing to conceptualise. Often, we can look around and see elements of our world, societies, cities and daily lives (just to touch on a few things) that are almost exactly as they were a hundred, two hundred years ago – or more. This is very true of many places within the Danube River Basin: from small villages to

big cities. What can be difficult to imagine, however, is the ways in which the natural world around us changes, or, as is often the case, is changed.

In our most recent issue of Danube Watch, we highlighted a book by Gertrud Haidvogel, *Wasser Stadt Wien: Eine Umweltgeschichte*, which addresses the history of the Danube River and the numerous streams and creeks that defined and shaped the city of Vienna. The book also discusses the history of how and why these waterways changed, how the people living in the area changed them, in fact. The reasons are varied and many. What is important here is that these waterways are not the same waterways that shaped Vienna. This is also true of other parts of the Danube upstream and down, of the large tributary rivers and the small streams in the Basin. Maps greatly help the book highlight these dramatic shifts by allowing the reader to visualise the historic flow of Vienna's waterways.

For anyone with even a passing interest in the Waterways of the Danube River Basin, a bit of visual historical context can fill in information gaps or, at the very least, provide a fascinating glimpse into the way in which the region has changed over time. What areas had been wooded, which had been flood plains, which are now towns, cities, farmland, natural parks – this information does not need to be the stuff of idle pondering. Thanks to a uniquely interesting website, the past and the present can be compared directly.

Mapire.eu is a website consisting of digitalised historical maps from across Europe, but with a great focus on the Habsburg Empire and its successor states, digitally scanned and uploaded by the Budapest based Hungarian company Arcanum. The website has also been created with Gábor Timár, PhD as its scientific advisor and with the cooperation of many institutions including:

me-Machines

- ◆ The Austrian State Archives,
- ◆ The Hungarian National Archives,
- ◆ The Government Office of the Capital City Budapest,
- ◆ The Croatian State Archives,
- ◆ The Hungarian War Archives,
- ◆ The City Archives of Budapest and
- ◆ The Department of Geophysics and Space Science, Eötvös University.

With all of these resources put together in one place, the whole of the Danube River Basin can be better understood with the aid of historical context. This is due in no small part to Mapire's unique tools. Rather than simply presenting historical maps which have been painstakingly digitalised and uploaded, the website allows users to zoom in and out to see the most minute details contained within these maps.

This would all be wonderful enough, but Mapire takes everything a step further. Once users have chosen a particular historical map to pore over, an 18th century Austrian map of the imperial lands south of the Enns river, for example, they then have the ability to choose a 'base-level map' from either a current standard map or current satellite image map of the very same region. Then, using a slider-tool, the user can slide the image between 100% historical map view and 100% current map view, including any percentage in between, allowing the user to blend the maps together and really take in the dramatic changes and similarities that are revealed.

There are, of course, many other great tools users have access to. For example, users can also simply view the two maps side-by-side and synchronise them to scroll over the same areas at the same time. The site offers the ability to search for specific cities or regions easily, and also measure distances on whatever map is being viewed. Furthermore, some historical maps have even been digitalised in such a way as to allow them to be viewed in 3D, showcasing the geographical terrain and making the viewing experience feel all the more physical.

The process of achieving the quality digitalised versions of historical maps requires expertise and research. The first step when handling the old maps is 'geo-referencing'. The GPS coordinates for each pixel of the image, i.e. its position on Earth, must be determined. To do this, the methods used to create the original map must be determined along with the projections used and the projection parameters. This requires deep research and a great deal of practice. Serious manual work is required after the theoretical setup in order to perform the operation of geo-referencing properly. When this process has been carried out, the opportunity to view old maps together with current maps within a single system is possible.

The accuracy of the historical maps depends on the scale on the creation method of the original map. In the case of 1:2.880 scale cadastral maps from around 1850, the accuracy can reach up to 15 to 20 meters. During geo-referencing, maps of up to thousands of sections can be organised into a single image.

Top-end map scanners for large-scale, high-quality digitisation of large maps are utilised during this process. Thanks to their unique picture quality, very small texts on the old maps are also sharply displayed. With a gentle, precision roller mechanism, even the thinnest of documents is able to be scanned without damage. The scanning and lightning technology of these map scanners is designed to ensure that these old documents are not subjected to any harmful effects. The time under illumination is extremely short, thanks to the fast imaging sensors, which also prevents light-damage from harming the original maps.

For those who share the ICPDR's love of maps and the Danube, Mapire.eu offers an educational experience that will not disappoint. The only danger is the amount of time that someone can spend poring over the old maps, comparing them to maps of the regions today and deepening their knowledge of the lay of the land – so to speak. Go see what the Danube was and what it is, and then see where you end up.

PlasticFreeDanube –

Where does all the plastic come from and how does it move in the Danube?

by Iris Kempter, viadonau

Although plastic has many advantages, it has become a global environmental hazard. It is estimated that around 80% of plastic polluting the world's oceans is transported via rivers. However, sources and pathways of plastic in the rivers and its environmental impacts remain widely unclear. The project PlasticFreeDanube, with a duration of 3.5 years (1 Oct, 2017 – 31 Mar, 2021) and funded by the EU-programme Interreg SK-AT, focused on macro-plastic waste (> 5 mm) in and along the Danube river between Vienna in Austria and the hydropower plant Gabčíkovo in Slovakia as well as parts of its riparian area. The overall aim of the project was to establish a scientifically sound knowledge-base as well as a methodological approach on plastic waste in and along the river in terms of entrance points, quantities, transport patterns and environmental threats. Awareness-raising and the derivation of possible measures against pollution were further goals.

Sorting analyses & material flow

In order to determine the sources and origin of plastic pollution in and along the Danube, 2,000 kg of collected plastic waste was sorted and analysed. The collections took place mainly under the coordination of the Donau-Auen National Park and with the help of volunteers. The results show that the composition of the found plastic waste varies depending on the collection area: In the waste from litter on the Danube Island, a lot of sanitary waste (especially cleaning tissues) and packaging was found. Samples from the hydropower plant Freudenuau contained higher amounts of plastic waste from households, sport and leisure activities as well as waste from ships (ropes, buoys).

Washed-up waste on the riverbanks was characterised mainly by plastic from households and packaging, but also by a large portion of foamed plastic. In the hinterland, a high portion of PET drink bottles and foamed plastic was found. A newly developed sampling and sorting protocol helps to compare the results and should act as a manual for other projects in the future. Pollutants are often not found at the source of emission. This is especially true for plastic deposits in the area of the Donau-Auen National Park. The low weight of plastics favours drifting by wind and transport with rainwater over long distances. In order to derive appropriate prevention measures, it is important to know the origin of plastic waste and how it enters the Danube. With the help of a material flow analysis (MFA) this can be shown quantitatively. It shows sources, pollution hotspots and entry and discharge points of plastic waste into the Danube.

Chemical analyses

Leaching experiments were done in order to evaluate the possible hazardous materials leaching from the plastic waste and the generation of microplastics. Samples of the collected plastic waste were placed into glass bottles containing 80 ml of ultra-pure water and left there for approximately one month to shake in at 560 rotations per minute (r/min). Since the quite high rotation generates some shear force through vortexes, the generation of microplastics was examined as well. For the evaluation of microplastic, generation micro-FT-IR and optical microscopy were used. The decanted water was analysed by gas chromatography coupled with mass spectrometry in order to detect

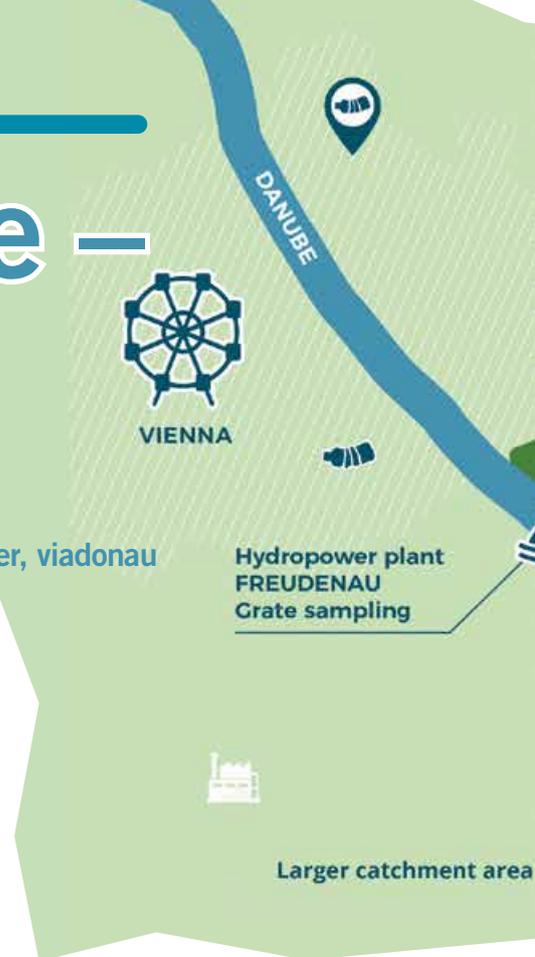
the leached organic substances. The concentrations of detected organic substances were well below some hazardous limits. Chemical analysis concerning metals detected in the case of PET bottles showed an elevated concentration of antimony of approximately 200 µg/l at the limit value of 5 µg/l for drinking water.

Plastic transport in the Danube

On the one hand, plastics can be carried into the river via tributaries such as the Danube Canal in Vienna. On the other hand, they can also get caught in the grates of the hydropower plants. To better estimate these input and output paths, measurements were carried out in the Danube downstream of the Freudenuau power plant and at the end of the Danube Canal from the Freudenuau harbour bridge using specifically developed trap nets. The



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nets covered three different depths (near the surface, in the middle of the water column and near the bottom) and had mesh sizes of 0.25 mm (250 µm), 0.5 mm (500 µm), 2.4 mm and 8 mm, respectively. At the Freudenua harbour bridge, the entire transverse profile was covered with five perpendiculars, at each of which sampling was carried out for half an hour. Additionally, GPS tracer were used for the tracking of single macro plastic pieces in the Danube.

Accumulation zones – 3D hydrodynamic modelling

Within the framework of the project, an attempt is made to characterise various macroplastic accumulation zones along the Danube east of Vienna on the basis of hydrodynamic-numerical modelling. Using a specially developed tool for particle tracking, the complexity of the flow fields near the surface has already been demonstrated with respect to hydrological conditions and bank structure. In addition, a large-scale model was created with the software RSim-2D to analyse the bank near accumulation as well as in the flood plain.

In order to interpret the models, the simulation results were linked with data

from field surveys and statistical analysis of water level and discharge conditions. During monitoring activities in the field, accumulation areas near the bank were found along the shore line of frequently occurring water levels. For this reason, hydrological series of Danube flows were used, with the most frequent water levels being determined for spring and summer or autumn and winter, depending on the hydrological regime. With the water levels from the numerical simulations, areas with a high accumulation potential could thus be determined and quantified.

Further simulations carried out in the project deal with the influence of hydraulic structures and vegetation on the accumulation behaviour at different discharges. The knowledge gained should help to define targeted collection areas and to design artificial accumulation areas.



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Awareness raising & capacity building

Raising public awareness of the problem of plastic waste in the nature in general, and in rivers in particular, is the key to sustainable behaviour changes. Therefore, information events and workshops were organised, and informational materials for schools and other educational institutions were developed. All documents and reports can be downloaded on the digital communication and information platform launched by the project. The platform will continue to exist after the end of the project:

plasticfreeconnected.com

Moreover, an action plan for the management of plastic waste will be derived from the outcomes of the project and workshops with various stakeholders and decision makers.

The project was implemented by partners from Austria (BOKU- University of Natural Resources and Life Sciences, Vienna, viadonau, Donau-Auen National Park) and Slovakia (RepaNet o.z., Polymer Institute SAS) and with assistance from various strategic partners, e.g. the Austrian Federal Ministry for Climate Action and the ICPDR.

Community Commitments: ICPDR Observers

Environmental protection is a community responsibility, and the active involvement of the public was one of the core principles of sustainable water management acknowledged by the Danube River Protection Convention (DRPC) when it was signed in 1994.

The ICPDR has shown that public participation in decision making is central to gaining broader support for its work towards healthier water bodies. The input of stakeholders is vital to developing management strategies that really work. Thus, in keeping with commitments to engage the public, the ICPDR maintains a close relationship with a variety of organisations – representing public interest – defined by the DRPC as “Observers”.

To date, 24 organisations hold observer status – representing private industry and intergovernmental organisations – and through this status, cooperate actively with the ICPDR.

Observers represent a broad spectrum of stakeholders in the Danube River Basin, covering social, cultural, economic and environmental interest groups adhering to the goals of the Convention. The connective tissue between observers and the ICPDR is a shared ‘community responsibility’, essential to achieving long-term sustainable water management goals.

Institutionally, observers can comprise interest groups, non-government organisations (NGOs), and intergovernmental organisations.

While observers are not granted decision-making rights, they actively participate in all meetings of ICPDR expert and task groups, as well as plenary meetings (Standing Working Group and Ordinary

Meetings). Active participation means that delegates of observers have both access to information, including all technical meeting documents, as well as the right to contribute to all discussions. The continuing dialogue with stakeholders has been an important element of the success of integrated river basin management in the Danube River Basin. As of 2020, there are 24 organisations approved as observers, all of which had the opportunity to contribute to

the development of this management plan through the relevant expert groups, task groups and plenary meetings.

ICPDR Observers as of 2021

- ◆ Black Sea Commission (BSC)
- ◆ Carpathian Convention
- ◆ Central Dredging Association (CEDA)
- ◆ Danube Competence Center (DCC)
- ◆ Danube Civil Society Forum (DCSF)
- ◆ Danube Commission (DC)
- ◆ Danube Environmental Forum (DEF)
- ◆ Danubeparks
- ◆ Danube Tourist Commission (DIE DONAU)
- ◆ Danube Sturgeon Task Force (DSTF)
- ◆ European Anglers Alliance (EAA)
- ◆ European Barge Union (EBU)
- ◆ European Water Association (EWA)
- ◆ Friends of Nature International (NFI)
- ◆ Global Water Partnership (GWP/CEE)
- ◆ International Association for Danube Research (IAD)
- ◆ International Association of Water Supply Companies in the Danube River Catchment Area (IAWD)
- ◆ International Hydrological Programme of the UNESCO (IHP/Danube)
- ◆ International Sava River Basin Commission (IS-RBC)
- ◆ RAMSAR Convention on Wetlands
- ◆ Regional Environmental Center for Central and Eastern Europe (REC)
- ◆ VGB PowerTech e.V. (VGB)
- ◆ viadonau
- ◆ World Wide Fund for Nature – Danube-Carpathian Programme (WWF-DCP)

The Nuts and Bolts: What Our Public Consultation Looks Like

Planned Public Consultation Measures

- ◆ A simple and accessible online questionnaire related to general aspects of the DRBMP & DFRMP Updates 2021 seeking to discover knowledge gaps in the general public. As such, it will also serve as an information tool to draw attention to the two management plans;
- ◆ A stakeholder workshop (Our Opinion – Our Danube) to discuss the two management plans in detail (to be held online via Zoom on 29-30 June, 2021). The symbolic date of Danube Day is perfectly situated to discuss the future of our shared river basin. Up to 100 participants should be admitted (flexibility to adhere with all possible COVID-19 restrictions should be planned for);
- ◆ Consultation activities to be supported by information materials on the two management plans, including a Social Media campaign, plus texts for publication both on- and offline;
- ◆ A final report on both the results from both questionnaires and stakeholder workshop will be developed by the end of August, 2021 to be provided to RBM EG and FP EG for consideration.

A report on Public Consultation activities detailing all consultation carried out, and input received from all sources during the public consultation to be developed in time for the formal adoption of the management plans.

Public Consultation Questionnaire

We are proud to launch our online public consultation questionnaire!

The online questionnaire seeks input of the public living in the Danube River Basin, aiming to engage with and get input from a broader public on the issue of our two plans, available in 10 Danubian languages, in addition to English. It has been designed to be both informative and to help the ICPDR to find out more about public perception and knowledge of draft management plans in the River Basin. It can be filled in even without any prior knowledge of the plans.

<https://www.icpdr.org/forms/wfd-fd-questionnaire-2021-languages>

Stakeholder Consultation Workshop: Our Opinion – Our Danube

The ICPDR will be hosting a one-and-a-half day (online) stakeholder workshop, where stakeholders and interested parties from across the Danube will be invited to contribute their input to the Public Consultation of the DRBMP & DFRMP Updates 2021. Make sure to save the date and mark your calendar for 29-30th June!

This workshop will be taking place via Zoom, with a full programme spread across two days, including keynote speeches, introductions to the plans, and a Danube Café workshop session to gain input from stakeholders on five key 'thematic areas'.



How To Send Us Your Comments

Individuals, public bodies, NGOs and other interest groups to make comments on the schedule, draft plans and other relevant documents relating to the 3rd DRBMP and the 2nd DFRMP. The public is invited to provide comments on this documents to the ICPDR Secretariat:

Address:

ICPDR Secretariat
Vienna International Centre, Room D0412
Wagramer Strasse 5
A-1220 Vienna, Austria

E-Mail:

wfd-fd@icpdr.org



Talking with Two ICPDR Dinosaurs

Two influential personalities reflect on the beginnings of the ICPDR. They were there then, back in the early nineties, working to put it all in place, and they are here now to explain the special circumstances that led to its success.

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.

“Fritz Holzwarth, former Head of Delegation and President of the ICPDR, and Ivan Zavadsky, current Executive Secretary of the ICPDR, sat down with the Danube Watch Editorial team to discuss the formation of the ICPDR from their first-hand experiences. After 25 years since the signing of the Danube River Protection Convention, the fact that the ICPDR was formed and that it has worked as successfully as it has over the years is surely a special case. In this first instalment of our new Dinosaurs interview with Mr. Holzwarth and Mr. Zavadsky, they focused on the special way in which the ICPDR formed around the countries of the region in a very inclusive manner.

The creation of the ICPDR depended upon the coming together of the many countries through which the Danube flows. Of course, this meant that governments that had recently been on opposite sides of the Iron Curtain now needed to join together closely for the sake of the Danube. This, of course, came with its own challenges. “When representatives of the Eastern countries came to Germany and Austria in early 1990s, we in the west had very little information about the downstream countries and what they had been doing to manage their stretches of the Danube”, remembers Mr. Holzwarth.

“And so, the most important element of this process was that we took an integrated perspective from eastern and western Europe”, he continues. “Yes”, adds Mr. Zavadsky, “understanding absolutely had to come first. This degree of bridge building between these two sides of the Iron Curtain was a completely new idea”.

“I would say”, continues Mr. Holzwarth, “that the most important part of this process was that we started to understand each other. Each country had different water management issues, and each had national action plans which were important for the development of the ICPDR. There is no doubt about that”. Stressing the unique sense of the future prevalent at the time, Mr. Holzwarth says that “this is an underestimated aspect, that there was a willingness to understand each other and leave behind the burden of previous conflicts and the fact that not all countries had been part of the Danube process from the very beginning”.

Mr. Zavadsky clarifies the perspective of the eastern Danube countries by pointing out that “this mutual respect was very important. We were approached by the West with respect, and they were willing to understand that we had an existing sys-

tems of water management. We had our shortcomings but there was a tradition, the basic foundations were there”. In fact, and as the two were both quick to point out, many countries had water management systems that had been based on old Austrian water law. “The Austro-Hungarian tradition really is something when it comes to water issues, especially scientifically and technically”, explains Mr. Holzwarth. “And, as I learned when reading many articles and books, this was the foundation for water management perspectives for a lot of the downstream countries”.

This proved to be extremely useful to the foundation of the pan-regional water management and, ultimately, the ICPDR. As Mr. Zavadsky puts it, “when there was something that countries were united on, we jumped on it, so we would not have to start from scratch”. Providing a concrete example, he continues, “the Czechoslovak water law of 1973 was specifically based on Austrian and Hungarian water laws. We must not forget that the ICPDR covers 7 countries formerly part of the Austro-Hungarian Empire. The tradition and system was there, and the state administration was based on this tradition”.

It must be appreciated that this approach to regional cooperation that created the ICPDR still required formal steps in order to guarantee its success. “It was so clear in the mid 90s”, explains Mr. Holzwarth, “that we needed an institutional body beyond the convention, that we needed an interim secretariat in Vienna. The role of the interim secretariat was to get a fixed point in the universe, in the whole process”, clarifies Mr. Zavadsky. “All the processes to that



Fritz Holzwarth

was appointed Deputy Director General for Water-Management in the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety in 1991. He acted as Head of the German Delegation for the ICPDR as well as President in 2003. His career includes ceaseless work to protect Europe's rivers in numerous roles that we could not fully list here.



We hope these personal insights into the beginnings of the Danube River Protection Convention and the ICPDR were as entertaining to read as they were for us at Danube Watch to listen to!

PART 3

point were bits and pieces but not really connected”, elaborates Mr. Holzwarth, “what was a preliminary instrument was also a starting point from which we could look at the whole basin and not simply these bits and pieces”.

The Sava process proved vital for the region of the western Balkans at the time, and not simply for the reason of better water management. “It was clear after the conflict in the Former Yugoslavia that the Sava process was moving forward in parallel, but that the umbrella for the whole process was the ICPDR”, says Mr. Holzwarth. “Yes”, agrees Mr. Zavadsky, “the Sava process acted as the very first basic building block to bring peace and prosperity back to the Balkans. But it never would have been so fast and efficient without the ICPDR template and experience”.

The importance of such a process taking place for the first time with a basin-wide perspective politically and in terms of inclusion can not be understated. “There was a bridge building process in the western Balkans that was really started by the Sava process”, says Mr. Holzwarth. He continues by stressing that “when we started to work together, there was no cooperation in the Former Yugoslavia. It was like a grey zone as there was nothing. Sometimes people forget that that was a really heavy war”. Mr. Zavadsky tells that “there was, however, no need to develop and negotiate from scratch with the Sava process because it was essentially copying and pasting in the process from the ICPDR convention”. “Step by step”, adds Mr. Holzwarth, “this former Yugoslavia grey zone on the map vanished as the Bal-

kan states that made it up came on board with these political processes which were the first key building process in the region. The role of the whole process in the integration of the Balkan region is really very often underestimated”. Mr. Zavadsky agrees and adds that “it was also easy for the architects of Sava agreement because the Balkan governments already had experience working with the ICPDR in the basin, and had faith in the way the ICPDR operated and fostered cooperation”.

This success, of course, goes back to the mutual-respect approach between the western and eastern Danube countries which, according to Mr. Zavadsky, existed in no small part because of Mr. Holzwarth. “At the time”, he explains, “we were both Heads of Delegation, but Fritz came in as a mighty DDG* Deputy-Director General (editorial note) from a federal ministry of a rich western country. In a time when everything ran west to east, north to south he could have continued with the

state of mistrust. But no, Fritz was willing to step out of traditional role of a rich western donor and even turn everything around by asking us in the east what it was we needed, and how we could achieve it jointly”. “I remember well”, tells Mr. Holzwarth, “that I said to my EU colleagues that in the downstream countries it was

not the case that they were starting from scratch regarding water management. No, there was scientific and technological understanding and competence on water management that neither the EU nor the other countries had been aware of”. There was still a great deal of progress to achieve, but this attitude already made a massive difference.

“He made sure to instruct experts and politicians from Germany on all levels to be courteous and listen to these new colleagues”, reiterates Mr. Zavadsky, “We all greatly appreciated that because politically, we in the east needed the help and expertise. It was Fritz, though, who was able to listen to the east to hear our concerns and troubles so we could overcome the barriers to developing our water management systems into what existed in western Europe. He was able to listen and understand, to slow down on their side so that the eastern countries could catch



Ivan Zavadsky

Born on the Slovak banks of the Danube, Ivan Zavadsky came from a family of water managers. A vital part of his home country's EU accession process, and one-time project manager of the foundational Danube Regional Project – a key precursor to the ICPDR – Zavadsky has been our Executive Secretary since 2013.

up. This meant that, rather than being led around, we were walking side by side. It really is something that everyone involved then and the ICPDR itself have never forget”.

* Deputy-Director General (editorial note)



The Joint Danube Survey

JDS4: The Most Comprehensive River Survey in the World



The Joint Danube Survey is the most comprehensive investigative surface-water monitoring effort in the world, taking place once every six years. It harmonises water monitoring practices across the Danube countries, in support of the EU Water Framework Directive (WFD), to achieve good water status. Teams of international scientists travelled to monitoring stations and points in the Danube River Basin to take samples and measure aspects of the river's status – from pollution and biodiversity to plastic and radiation levels. The survey provides an up-to-date and comprehensive picture of the status of the Danube River Basin, including tributaries, surface water bodies and groundwater alongside the Danube River itself.

Coordinated by the ICPDR, many hundreds of experts in the countries of the Danube River Basin, as well as other actors, engaged in the fourth Joint Danube Survey (JDS4) in 2019 and 2020. The final results have now been published and made available to the public and scientific communities online. This time, JDS4 also provided an opportunity to deploy a variety of new and groundbreaking

techniques in the Danube River Basin – including Environmental DNA (eDNA) as well as target and non-target screening methods. The JDS4 results, therefore, give us unique insight into the status of the Danube River Basin, including answers to such questions as:

- ◆ How many chemical substances find their way into river waters?
- ◆ How many fish live in the Danube River Basin?
- ◆ How much microplastic debris finds its way into the Danube and its tributaries?

Similar to JDS3, the findings of JDS4 support the implementation of the WFD, providing an extensive and homogeneous dataset acquired by WFD-compliant methods. While there is no ambition to replace the national data used for the assessment of the ecological and chemical status with this JDS4 data, it is an excellent reference database which can be used for WFD assessment methods harmonisation throughout the Danube River Basin, and for the new derivation and prioritisation of the Danube River Basin Specific Pollutants.

To collect all of this data in a way that is readily comparable across the region's

countries was seen as essential. In order to ensure that experts could provide comparable results, training workshops were organised prior to JDS4 so that methodologies could be harmonised. This was the first time ever that experts on all WFD biological quality elements from all ICPDR Contracting Parties met to discuss monitoring and assessment harmonisation issues. Already during this overture to JDS4, the significant benefit of the new concept could be seen. By making sure data was gathered in a way that could be compared, JDS4 experts could measure changes and shifts in water status and chemical make-up along the Danube's journey. They could then measure changes in such a way as to make the results comparable between all sampling teams.

JDS4 also helps to fill the gaps in WFD implementation. While the WFD is stimulating higher standards for water status across the continent, JDS4 focused on the Danube Region specifically, allowing it to cover specifics that the broader WFD implementation might miss. There are further important issues that have their effects at the Danube level, which may not apply to the entirety of Europe or the surrounding area. This highlights the importance of

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'.

See Foldout Map for JDS4 Sampling Sites



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basin-specific studies like JDS4. Although WFD is an invaluable tool for the future of the EU and Europe in general, projects like JDS4 enable us to be even more focused and to even go a step beyond the requirements of the WFD.

The goal of JDS4 is to collect data on a variety of parameters, including several which are not normally analysed, and certainly not in such a comparable way across the Danube River Basin. All kinds of data are measured every day across the Danube, but JDS4 is about getting all the extra information on many issues which are not normally in focus. JDS4 is about capturing a detailed snapshot of the status of the biology, chemistry, hydromorphology, pollution, and much more, of the entire Danube River Basin and then putting all of this knowledge into the wider context.

As important as measuring the broad state of the river is, the survey focused on going in deep and gaining some insight into previously unmonitored substances and phenomena. These include rare earth elements, rare species (now discernible via eDNA), trace amounts of a myriad of substances (including party drugs), microplastics and antibiotic resistance in bacteria.

Additional ambitions of JDS4 stem from the parallel use of classical monitoring methods in biology and chemistry, with novel approaches such as eDNA and non-target screening.

With these new practices, JDS4 was able to show, as an example, that despite ongoing pressures on fish species in the Danube and its tributaries, most of the Danube's fish species could still be found at nearly all sites - even in the strongly altered hydromorphological stretches of the Upper Danube. In total, 76,265 specimens of 72 fish and three jawless species were detected. This underlines the importance of the Danube as a substantial source of fish biodiversity in Europe. It was not all good news though: The considerable influence of invasive alien species in the Danube River and its main tributaries was also reconfirmed.

JDS4 has provided a great deal of added value to the current monitoring practices in the Danube River Basin, including an independent basin-wide platform for improving national surface water monitoring practices. JDS4 also provides a unique source of data for a number of quality elements (especially for emerging substances) for the whole Danube as well as an interactive platform for hands-on training in sampling and assessment of these ele-

ments. This, of course, would not be possible without its practical joint testing and comparison of national methodologies for biological and hydromorphological quality elements, which will also lead to their future harmonisation. Importantly, these updated methods help to ease knowledge transfer between EU and non-EU member states, which is vital to Danube conservation efforts.

It is clear from JDS4 that many of the problems facing the Danube have been improving since JDS3. However, it is a multiple utilised ecosystem and a lot of work remains to be done. Additionally, we monitored several factors for the very first time, such as microplastics and eDNA, so we will not be able to track the next stages of progress accurately until JDS5. However, the valuable information collected will aid not only further scientific study, but also public engagement. Getting the public in the Danube River Basin on board with the project was seen as essential to the success of JDS4. To raise awareness of the Danube's water quality and ongoing protection efforts involved an intensive public outreach effort, disseminating JDS4 news to the stakeholders and wider public. We needed them to know – and still do – why their river matters, and we want them to feel welcome to get involved in JDS in any way they can.

Both our Scientific and Public Reports detailing the results of the survey are available online here: <http://www.danubesurvey.org/jds4/publications>



2020 Dan

Test your Danube knowledge with
We hope that you find this
Find the solutions at the

1

How many tributary rivers feed into the Danube?

- A. Fewer than 125
- B. Exactly 155
- C. More than 175



3

The Danube flows directly through nine countries, but through how many national capital cities?

- A. 4
- B. 7
- C. 5



5

83 million people live in the Danube Catchment Area. How many of these people depend on the Danube as a source of drinking water?

- A. 50 million
- B. 30 million
- C. 20 million



7

Of the roughly 100 fish species native to the Danube River Basin, how many are species of sturgeon?

- A. 5
- B. None, they are all extinct
- C. 2



8

9

The famous 'Danube School' refers to what?

- A. A dance school where the Waltz was invented
- B. A philosophical school of thought focused on man's closeness to nature
- C. A group of artists who painted mainly pure landscapes



ube Quiz!

our Danube Day-inspired quiz!
bit of trivia interesting!
bottom of the page.

2 The Danube is the second-longest river in Europe, but where does it rank globally?

- A. 15th
- B. 30th
- C. 50th



4 With a total length of 2,850km, how many total kilometres of the Danube are navigable?

- A. 1,520km
- B. 2,415km
- C. 2,850km



6 The Danube River Basin is not just home to millions of people; many animals also call the area home. How many unique animal species can be found in the basin?

- A. Fewer than 2,000
- B. More than 5,000
- C. Exactly 3,000



The ICPDR works closely with organisations that represent a variety of public interests. How many organisations currently have official observer status with the ICPDR?

- A. 6
- B. 12
- C. 24



Fold out to get a glimpse of the JDS4 sampling sites.

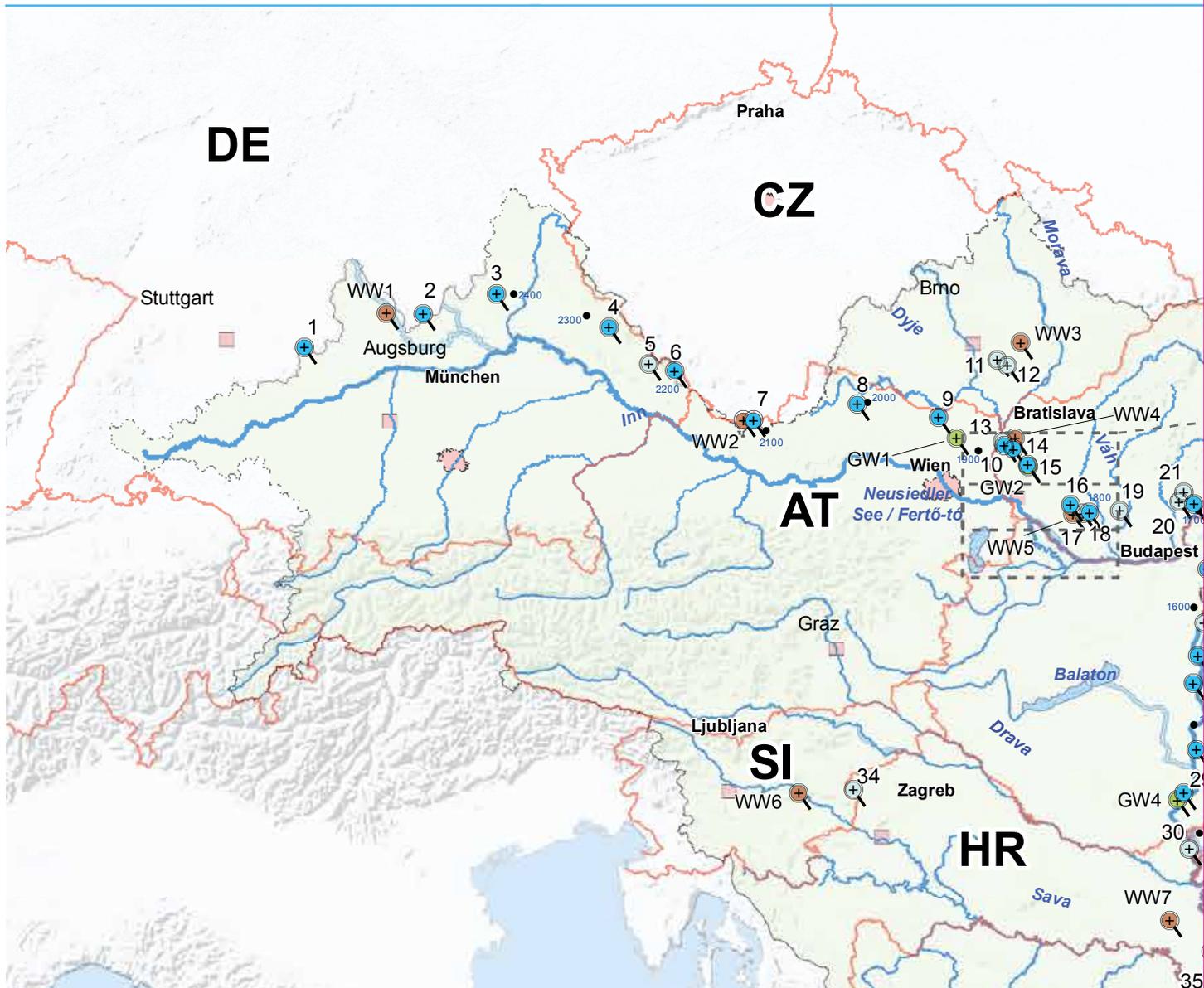


10 Nearly the entire length of the Danube acted as the historical boundary of what empire?

- A. The Roman Empire
- B. The Austro-Hungarian Empire
- C. The Ottoman Empire



JDS4 Sampling Sites



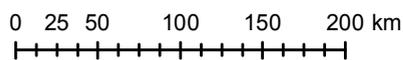
LEGEND

- Main Sampling Sites - Danube
- Main Sampling Sites - Tributaries
- Off-site sampling points
- Urban Waste Water Treatment Plants Sampling Sites
- Groundwater Sampling Sites
- River km (in 100 km steps)
- Danube River Basin District
- Danube River
- Tributaries (catchment area > 4,000 km²)
- Lake water bodies (surface area > 100 km²)
- Transitional water bodies
- Coastal water bodies
- Canals
- National borders



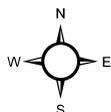
Cities:

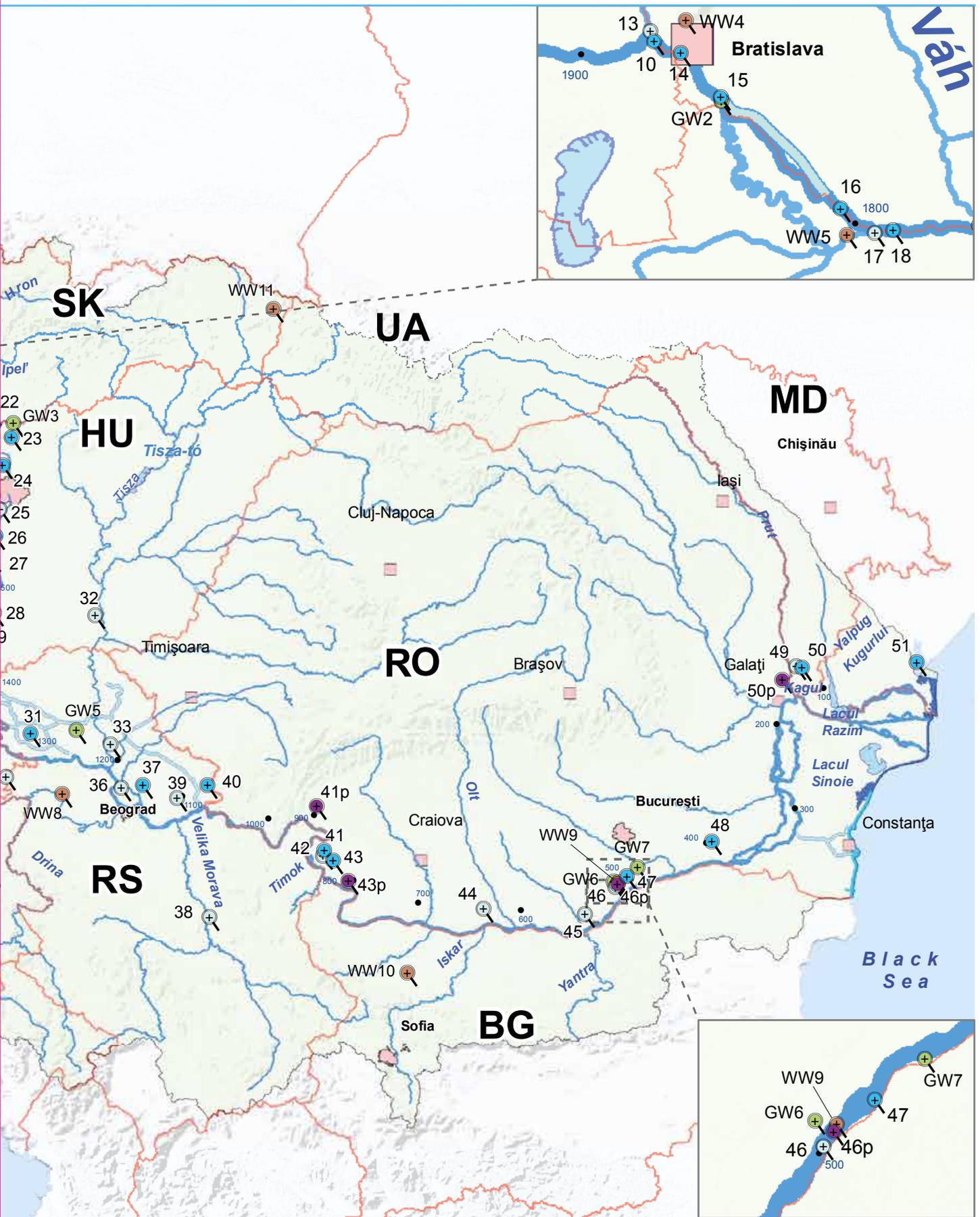
- 250,000 - 1,000,000 inhabitants
- > 1,000,000 inhabitants



Scale: 1 : 4,500,000

(Scale 1: 6,000,000 in A4 landscape paper format)





www.icpdr.org

ICPDR IKSD

for national borders of AL, ME, MK; Shuttle Radar Topography Mission (SRTM) from USGS.
 the European Commission (Joint Research Center) was used for the outer border of the DRBD of AL, IT, ME and PL.

International Commission
 for the Protection
 of the Danube River

Internationale Kommission
 zum Schutz der Donau



– Registration now open –

OUR OPINION – OUR DANUBE

ICPDR Stakeholder Consultation
Workshop 2021

29th to 30th June 2021

– Online via Zoom –

Tuesday 29th, 09:00 am – 15:00 pm

- Introduction to the Draft Plan Updates
- Stakeholder Input
- Danube Café

Wednesday 30th, 09:00 am – 12:00 pm

- Danube Café Results
- We Discussed Danube

Moderator: **Steve Chaid** / Support and co-organisation: **GWP-CEE**

Registration follow qr-code: [Meeting Registration – Zoom](#)

Contact: secretariat@icpdr.org



ICPDR IKSD

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

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

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