JOINT DANUBE SURVEY 5

www.danubesurvey.org

ZOOM INTO DANUBE

FOR THE MOST COMPREHENSIVE INVESTIGATIVE SURFACE-WATER MONITORING EFFORT IN THE WORLD

ICPDR IKSD

International Commission for the Protection of the Danube River

Internationale Kommission zum Schutz der Donau

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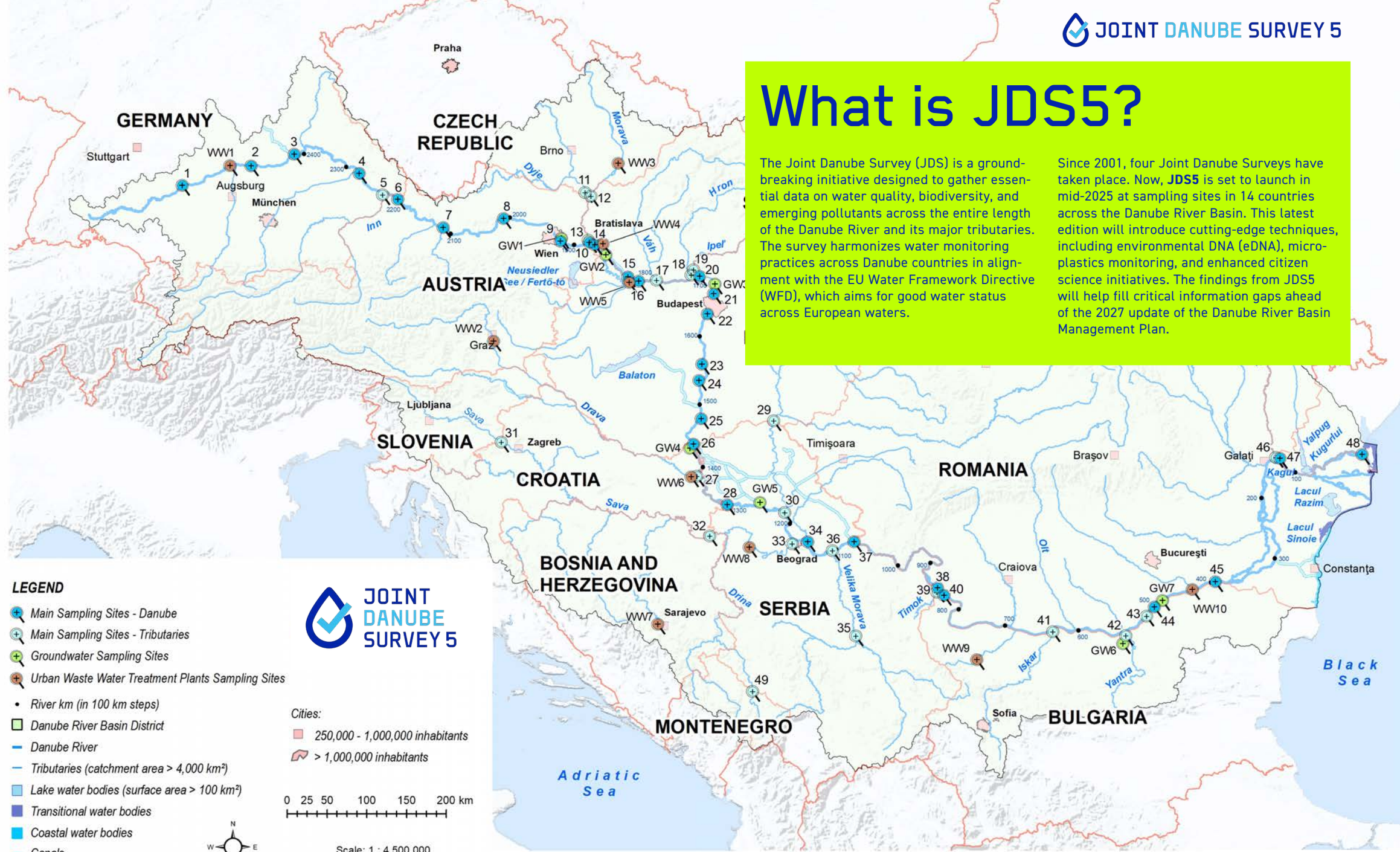
What is JDS5?

The Joint Danube Survey (JDS) is a groundbreaking initiative designed to gather essential data on water quality, biodiversity, and emerging pollutants across the entire length of the Danube River and its major tributaries. The survey harmonizes water monitoring practices across Danube countries in alignment with the EU Water Framework Directive (WFD), which aims for good water status across European waters.

Since 2001, four Joint Danube Surveys have taken place. Now, **JDS5** is set to launch in mid-2025 at sampling sites in 14 countries across the Danube River Basin. This latest edition will introduce cutting-edge techniques, including environmental DNA (eDNA), microplastics monitoring, and enhanced citizen science initiatives. The findings from JDS5 will help fill critical information gaps ahead of the 2027 update of the Danube River Basin Management Plan.



LEGEND

- Main Sampling Sites - Danube
- Main Sampling Sites - Tributaries
- Groundwater Sampling Sites
- Urban Waste Water Treatment Plants 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

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Cities:
- 250,000 - 1,000,000 inhabitants
- > 1,000,000 inhabitants

0 25 50 100 150 200 km

Scale: 1 : 4,500,000

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

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This ICPDR product is based on the Joint Danube Survey (JDS5) data. National borders data was provided by the Contracting Parties to the ICPDR and CH; ESRI data was used for national borders of AL, ME, MK; Shuttle Radar Topography Mission (SRTM) from USGS.
The rest of the background layers depicted in the legend, were taken from the ICPDR's DanubeGIS. Seamless Data Distribution System was used as topographic layer; Data from the European Commission (Joint Research Center) was used for the outer border of the DRBD of AL, IT, ME and PL.

Vienna, June 2025

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Zoom In(to) The Danube

The last Joint Danube Survey (JDS4) invited people to participate with the theme, "Discover Danube," exploring its vast waters, rich biodiversity, and the challenges it faces.

With JDS5, we're taking it a step further. This time, we want to bring people even further into the experience, encouraging them to **zoom in** and take a closer look at what's happening beneath the surface. From unseen pollutants to hidden ecological wonders, JDS5 offers an opportunity for everyone, scientists, citizens, and policymakers, to engage more deeply with the Danube than ever before.

The Danube River covers over 2,700 km, while its wider catchment area spans more than 800,000 km2, covering about 10% of continental Europe! The Danube River Basin is home to over 80 million people across 19 countries, making it the most international river basin in the world.

THE DANUBE RIVER IS DIVIDED INTO THREE 'REACHES':

- **Upper Danube:** Stretches from its source in Germany to the 'Porta Hungarica' east of Vienna.
- **Middle Danube:** Flows from Vienna to the Iron Gate dam between Serbia and Romania.
- **Lower Danube:** Continues from the Iron Gate to the Black Sea.

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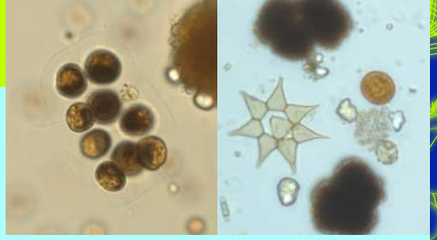
What do we want to achieve with JDS5?

JDS5 AND ITS 14 PARTICIPATING COUNTRIES HAVE SEVERAL MAJOR OBJECTIVES, INCLUDING:

- **Collecting Data on Special Parameters Not Normally Analyzed:** While daily monitoring of the Danube provides key information, JDS5 will go beyond routine assessments to detect emerging contaminants, microplastics, and other pollutants that may otherwise go unnoticed.
- **Ensuring Comparable and Harmonized Data Across the Region:** By using standardized monitoring methods, JDS5 ensures that water quality data can be accurately compared across all participating countries, helping scientists track changes along the Danube's journey from Germany to the Black Sea.
- **Citizen Science & Public Participation:** Citizen science will be a core component of JDS5, directly involving citizens, students, and communities in water protection efforts through hands-on water sampling, data collection, and educational outreach.
- **Raising Awareness of the Danube's Water Quality and Protection Efforts:** Public engagement is key! JDS5 aims to inform and inspire people across the basin, encouraging them to actively participate in protecting and preserving the Danube.
- **Filling Gaps in WFD Implementation:** The EU's Water Framework Directive (WFD) drives improvements in water quality across Europe. JDS5 will help address data gaps specific to the Danube River Basin, complementing national monitoring programs and supporting long-term policy decisions.



A Closer Look at Our Danube

AN INNOVATIVE APPROACH TO RIVER MONITORING

The ICPDR's monitoring of the Danube has never been more advanced. JDS4 introduced a new approach to river monitoring by involving national authorities more actively in data collection and analysis. JDS5 builds on this foundation, further enhancing collaboration, refining methodologies, and strengthening data harmonization across countries. This evolution ensures an even more comprehensive assessment of the Danube's health while fostering knowledge-sharing among experts throughout the basin.

By enhancing monitoring techniques and increasing coordination, JDS5 will improve data coverage and enable a more flexible approach to assessing water quality and biodiversity. Through closer cooperation between countries, the survey will provide even stronger insights into the river's ecological and chemical status and emerging environmental challenges.

JDS5 will enhance the specialized monitoring teams first introduced in JDS4, further refining research techniques and expanding data collection efforts. Building on previous advancements, JDS5 will take environmental DNA (eDNA) analysis to the next level, allowing scientists to detect species more precisely by analyzing DNA traces in the water. This enhanced approach offers deeper insights into biodiversity, particularly for elusive or endangered species.

Additionally, microplastics monitoring will expand upon previous surveys, tracking plastic pollution in the Danube's water, sediments, and aquatic life. Effect-based monitoring and non-target screening will continue to provide crucial insights into thousands of potential contaminants, assessing their impact on aquatic ecosystems and human health.

JDS5 will feature specialized monitoring teams conducting advanced research, including:

- **Environmental DNA (eDNA) Analysis:** JDS4 pioneered the use of eDNA for biodiversity monitoring in the Danube, marking a significant leap in how species are detected. JDS5 builds on this progress, enhancing sampling methods, refining data analysis, and expanding the scale of monitoring. This improved approach will provide even deeper insights into species diversity, making it easier to track elusive and endangered species while better understanding the overall health of aquatic ecosystems.
- **Microplastics Monitoring:** Microplastics have been found in rivers worldwide, but data on their presence in the Danube is still limited. JDS5 will expand research into microplastic pollution in water, sediments, and aquatic species to assess its impact and provide the first detailed dataset for the river basin.
- **Effect-Based Monitoring & Non-Target Screening:** Traditional water quality testing focuses on known pollutants, but what about the thousands of chemicals that may be affecting the ecosystem? This approach allows scientists to screen for a wide range of contaminants (including those not yet regulated) while also studying their biological effects, helping us understand how pollution impacts aquatic life and human health.

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WHAT WE LEARNED LAST TIME

JDS4 provided critical insights into the Danube River's ecological health, revealing both positive findings and ongoing challenges. A total of 72 fish species were detected, reinforcing the Danube's significance as a vital habitat for aquatic life. However, invasive species continue to threaten native fish populations, and hydromorphological pressures, such as dams and habitat fragmentation, negatively impact fish migration and biodiversity.

Water quality assessments showed improvements in some areas, but pollution hotspots were still identified. Certain sites exceeded environmental quality standards (EQS) for priority substances, emphasizing the need for continued monitoring and mitigation efforts. One of the most concerning findings was the presence of microplastics throughout the entire river, with samples taken from surface water, sediment, and aquatic species. This highlights the growing issue of plastic pollution and its potential impact on the Danube's ecosystems.

Chemical contamination remained a key concern, with perfluorooctane sulfonate (PFOS), a persistent organic pollutant and priority substance under EU regulations, detected at elevated levels in several sampling sites.

JDS5 will build on these discoveries, integrating new monitoring technologies and expanding public engagement to ensure a deeper, more comprehensive understanding of the Danube's ecological health.

GETTING THE PUBLIC INVOLVED: BE PART OF JDS5

JDS5 isn't just about science; it's about people. A river as vast and vital as the Danube thrives when communities, scientists, and policymakers come together to protect it. That's why public engagement is a key pillar of this survey. We're inviting citizens, students, and local groups to actively participate in safeguarding the Danube, whether through hands-on research, education initiatives, or community events.

One of the most exciting ways to get involved is through Citizen Science Programs, where participants can help collect water samples, analyze pollutants, and contribute to real scientific discoveries. Schools, universities, and youth organizations can join Educational Partnerships designed to inspire the next generation of river stewards. Meanwhile, interactive events like Danube Day bring people together to celebrate and learn about the river through festivals, clean-up initiatives, and creative activities led by local communities.

Beyond physical participation, JDS5 is expanding its media and digital outreach to make engagement more accessible. Our experience with local, national and international outreach is informed by our four previous surveys over the last 24 years.

Through social media, videos, and digital storytelling, we aim to connect with a wider audience and share the Danube's story in a compelling and interactive way. Whether you're an environmental enthusiast, a student, or simply someone who loves the Danube, there's a place for you in JDS5. Join us and be part of this extraordinary effort to protect one of Europe's greatest rivers.

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Get In Touch!

Stay connected with JDS5 and explore the latest updates, findings, and ways to get involved on our website: **www.danubesurvey.org**

For inquiries and more details, contact:
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JDS5 would not be possible without the support of the ICPDR Contracting Parties, whose generous in-kind contributions make this initiative possible. Their commitment to protecting the Danube enables this groundbreaking survey to take place, fostering a deeper understanding of the river's health and shaping its sustainable future. We extend our heartfelt gratitude for their dedication to science—which is not just an aspiration but a necessity for progress.

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Find us on social media:

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Let's Go Sampling Together!
Be part of JDS5 and help protect the Danube for future generations.