



# JOINT DANUBE SURVEY 4



# JDS4: AN INTRODUCTION

**ICPDR** **IKSD**

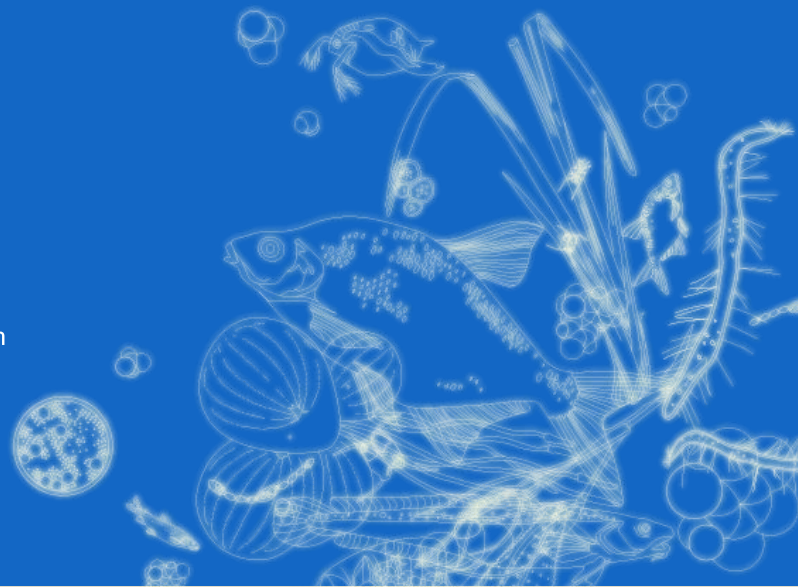
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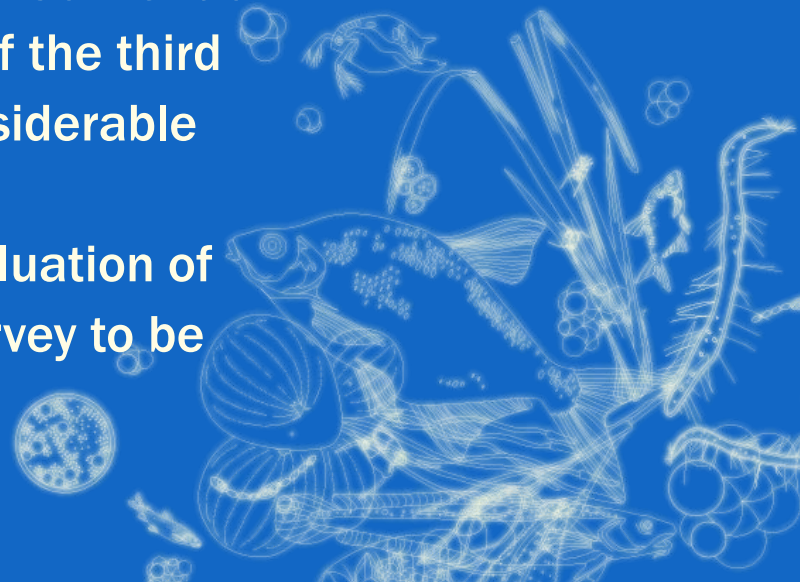
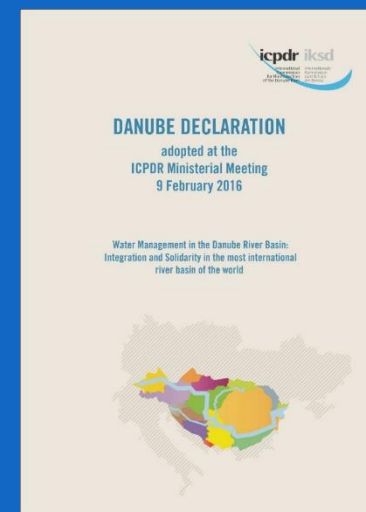
This action has  
received funding from  
the European Union

by Igor Liska, ICPDR



# Our Mandate: Danube Declaration 2016

“We, the Ministers, High Officials and the Member of the European Commission, being responsible for the implementation of the Danube River Protection Convention: appreciate the very valuable scientific results of the third Joint Danube Survey in 2013 as well as its considerable effect on awareness raising for the ICPDR, request the ICPDR to prepare, based on an evaluation of the previous surveys, a fourth Joint Danube Survey to be held in 2019, and commit to secure the necessary funding.”



# JDS4 Key objectives

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- ✓ Producing comparable and reliable information on a wide range of water quality elements for the whole Danube River including the major tributaries on a short-term basis;
- ✓ Providing opportunity for harmonization and training in WFD related monitoring;
- ✓ Covering information gaps for the Danube River Basin Management Plan Update;
- ✓ Parallel application & comparison of classical and new monitoring techniques (WFD assessment).

# 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 km<sup>2</sup>)
- Lake water bodies (surface area > 100 km<sup>2</sup>)
- Transitional water bodies
- Coastal water bodies
- Canals
- National borders

**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)

This ICPDR product is based on the Joint Danube Survey (JDS4) 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.



- ✓ Active engagement of national teams + very wide scope = largest amount of cooperating experts in the history of ICPDR;
- ✓ Very intense monitoring hands-on exercise, which significantly strengthened the basin-wide cooperation in WFD related monitoring in DRB.
- ✓ Majority of ICPDR expert bodies involved;
- ✓ Mutual benefits from cooperation with European networks: NORMAN, DNAqua-Net;

# JDS4 Cooperation

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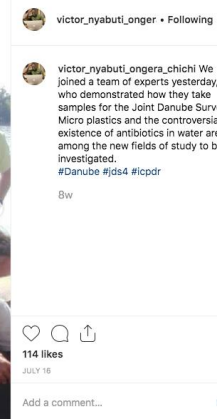
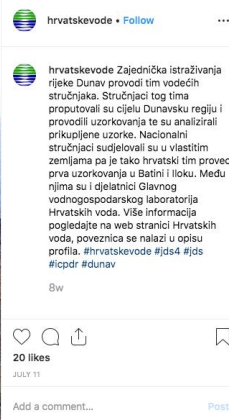


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- ✓ An intensive public outreach disseminating JDS4 news to the stakeholders and wider public;
- ✓ JDS4 motto 'Discover Danube', was designed as a call to public action towards a healthier and cleaner Danube;
- ✓ The Orange-Senqu River Commission's team of water resources quality officials joined the national teams during JDS4 sampling for observation and sharing of ideas.



# JDS4 Key findings

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- ✓ BQEs indicating pressure from nutrients and oxygen depletion by biodegradable substances – *Phytoplankton*, *Macrophytes*, *Phytobenthos*, partly *Macrozoobenthos* – indicated a good status at many sites and pointed at local pressure only;
- ✓ Fish and Macrozoobenthos indicated impacts induced by hydromorphological pressures at most of the sites;
- ✓ Danube was reconfirmed as a key source of fish biodiversity in Europe, but the fish community is threatened along the whole river;
- ✓ Pressure by IAS remains significant.

# JDS4 Key findings

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- ✓ Parallel application of traditional biological assessment techniques and modern molecular methods demonstrated a big potential of DNA and environmental DNA-based approaches for biodiversity and WFD ecological status class assessments (*particularly effective in detecting the hard to capture benthic taxa*);
- ✓ Analysis of antibiotic resistant bacteria showed a significant increase in multi-resistance (*three or more tested antibiotic classes*). Accumulation of resistance mechanisms in the Danube River *E. coli* population has continued over the last six years.



# JDS4 Key findings

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- ✓ Target analysis of WFD PS, EU Watch List and Danube RBSPs in water showed only occasional exceeding of EQS;
- ✓ Hg and brominated diphenylethers in biota showed concentrations higher than the EQS at all sites;
- ✓ Wide-scope chemical target screening and non-target screening proved to be a promising alternative to target analysis of WFD PS and RBSPs;
- ✓ Processing screening data (>2,600 substances from wide-scope target screening, >65,000 substances used for suspect/non-target screening) → prioritisation of DRBSP in water, biota, sediment, wastewater and groundwater.

# JDS4 Key findings

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- ✓ Analysis of groundwater showed that for some compounds lower concentrations were detected in groundwater than in the Danube, but the opposite situation was also observed;
- ✓ No current GW & DW EQS exceeded but new compounds may pose a risk;
- ✓ First ever comprehensive screening of microplastics along the Danube established a baseline of pollution by MP;
- ✓ Rare Earth Elements monitored (thank you NORMAN);
- ✓ Radioactive contamination of the Danube with artificial nuclear fission radionuclides  $^{137}\text{Cs}$  and  $^{90}\text{Sr}$  decreased 100x since Chernobyl accident (1986) - no indication of hazardous man-made radioactive contamination.

# JDS Data Collection Portal



Collect sample data & photos in the field



Upload datasets of analysis/determination



Validation & review of survey-wide outputs

#	Name	Countries	Latest sample	Samples
1	Böfinger Halde	DE	12.03.2019 - 19:45	3
1a	Example special survey site (for testing purposes only)		11.03.2019 - 20:00	12
2	Bittenbrunn 700m	DE	20.03.2019 - 20:00	1

store link  
validate  
update

aggregate  
filter  
visualise  
export



Database

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# THANK YOU FOR YOUR ATTENTION!

## Get in touch:

### [jds4@icpdr.org](mailto:jds4@icpdr.org)

### [www.danubesurvey.org](http://www.danubesurvey.org)



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