



NORMAN and the ICPDR

Joint Danube Survey 4

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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.

Vienna, October 2020

JDS4 sampling sites: 51 SW, 11 WWTPs, 7 GW, 9 PS, 51 biota, 19 MP...

JDS4 logistics – sample collection and distribution

x...main site number (1-51)
y...location in profile (L,M,R, or E)



0.25 L, for molluscs
JDS4-x-y-MC

Sediment for DNA analysis
(sampled by MZB team)



JDS4-x-y-SE_DNA
JDS4-x-y-SE_DNA
JDS4-x-y-SE_DNA



3x18 ml LifeGuard Soil
per one sampling point

0.5 L, for WRI (SK)
JDS4-x-y-SE_SER



Several thermo boxes of two dimensions with cooling inserts

1 L, for WRI (SK)
JDS4-x-y-SE_SER

Phytobenthos bulk sample for DNA analysis



2 x 0.5 L- JDS4-x-y-PB_DNA (both)



ethanol, undenaturated

Macroinvertebrates for DNA analysis



2 x 2 L- per sampling point



2 x sampling trays, cutter, edging marker 792, pencil, tweezers, lab spoon, 3x nitrile gloves (S,M,L), Virkon S -1kg, MS222-Tricaine 100g, two sizes – ZIP BAGS for fish, PP 10 L basket, Al-foil

JDS4-x-y-MZB_DNA
JDS4-x-y-MZB_DNA

LVSPE



MAXX



Horizon



Mariani box



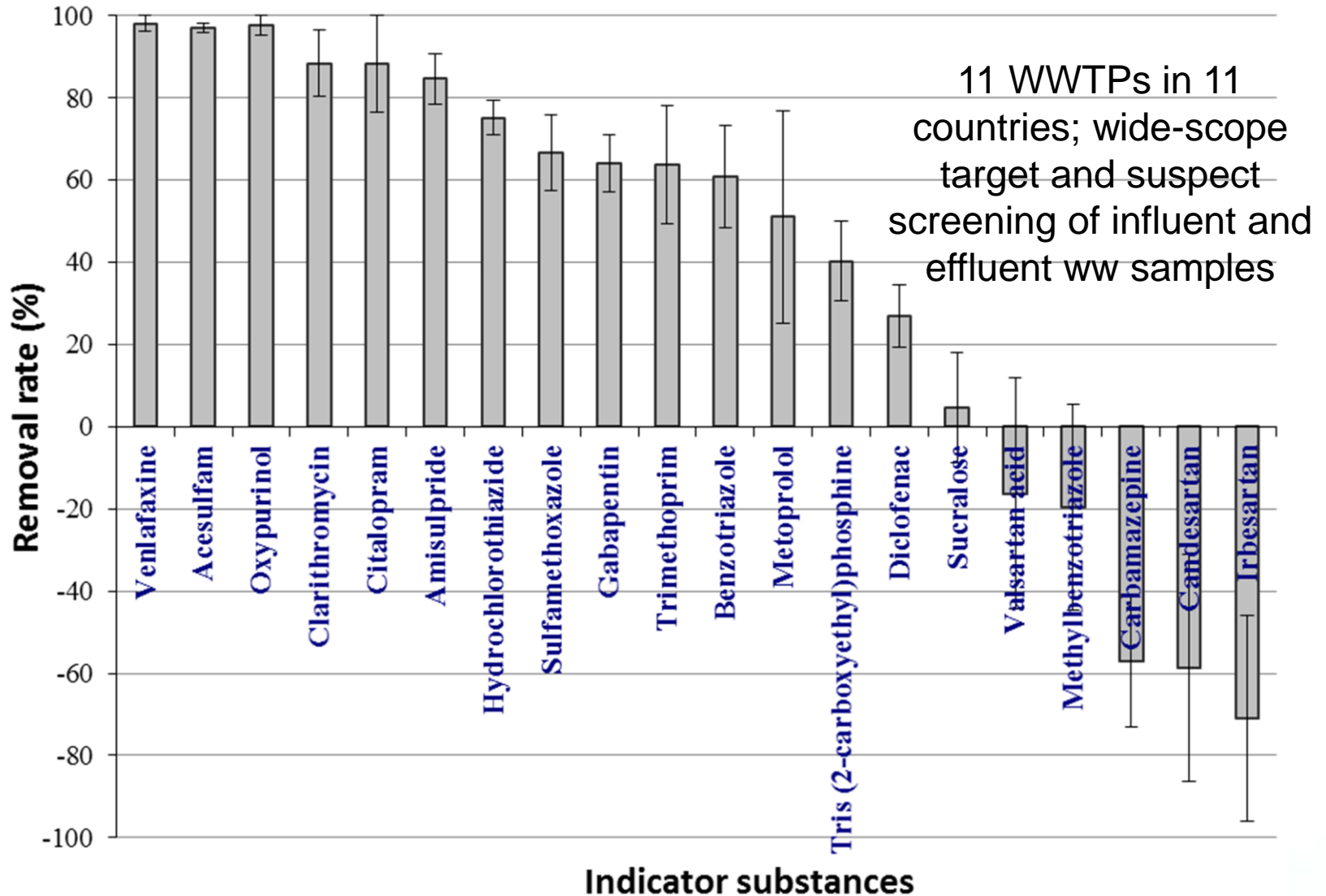
Identification of RBSPs via wide-scope target and suspect screening

- Dataset of 306,093 data entries in the NDS prioritised

Matrix	No. of substances	Detected	Candidate RBSPs
SW	2608	495	50
Biota	2360	101	19
WWE	2516	465	28
GW	2561	148	47

Suspect screening of 65,000+ substances; ca. 2000 identified; 935 not by wide-scope target screening

JDS4 and revision of the UWWTD



JDS4 and revision of the UWWTD

	EWW Asten AT	EWW Vratsa BG	EWW Hodonín CZ	EWW Donauwörth DE	EWW Županja HR	EWW Győr HU	EWW Giurgiu RO	EWW Šabac RS	EWW Novo Mesto SI	EWW Bratislava SK	EWW Uzhgorod UA
PAH CALUX	17.7	11.0	14.8	5000	14.2	13.9	5.6	11.8	9.0	27.4	16.1
ERα CALUX	13.0	29.0	24.0	15.0	15.0	8.5	22.0	16.0	2.5	6.2	19.0
Nrf2	6.8	<LOD	<LOD	29.0	18.0	16.0	3.9	2.4	2.9	3.1	3.3
PXR CALUX	<LOD	<LOD	85.7	41.7	49.3	23.0	25.0	34.3	21.0	28.7	22.7
anti-AR CALUX	1.6	1.9	1.6	2.2	<LOD	0.9	<LOD	0.8	<LOD	<LOD	0.8
PPARγ CALUX	<LOD	<LOD	<LOD	63.0	<LOD	82.0	<LOD	<LOD	<LOD	<LOD	<LOD
GR CALUX	0.4	<LOD	<LOD	1.2	<LOD	<LOD	0.6	<LOD	<LOD	<LOD	<LOD

Mixture toxicity - exceedances of effect-based trigger values (EBTs) by a battery of in vitro SOLUTIONS/NORMAN bioassays

Prioritisation of wide-scope target and suspect screening has indicated that **these novel monitoring techniques are vastly superior compared to traditional monitoring of a few legacy substances** and provide both 'early-warning' and 'safety net' signals needed for holistic chemicals management.

The **traditional monitoring** applied in compliance with the current environmental legislation **does not sufficiently protect the Danube ecosystem.**

The effect-based monitoring is a MUST!