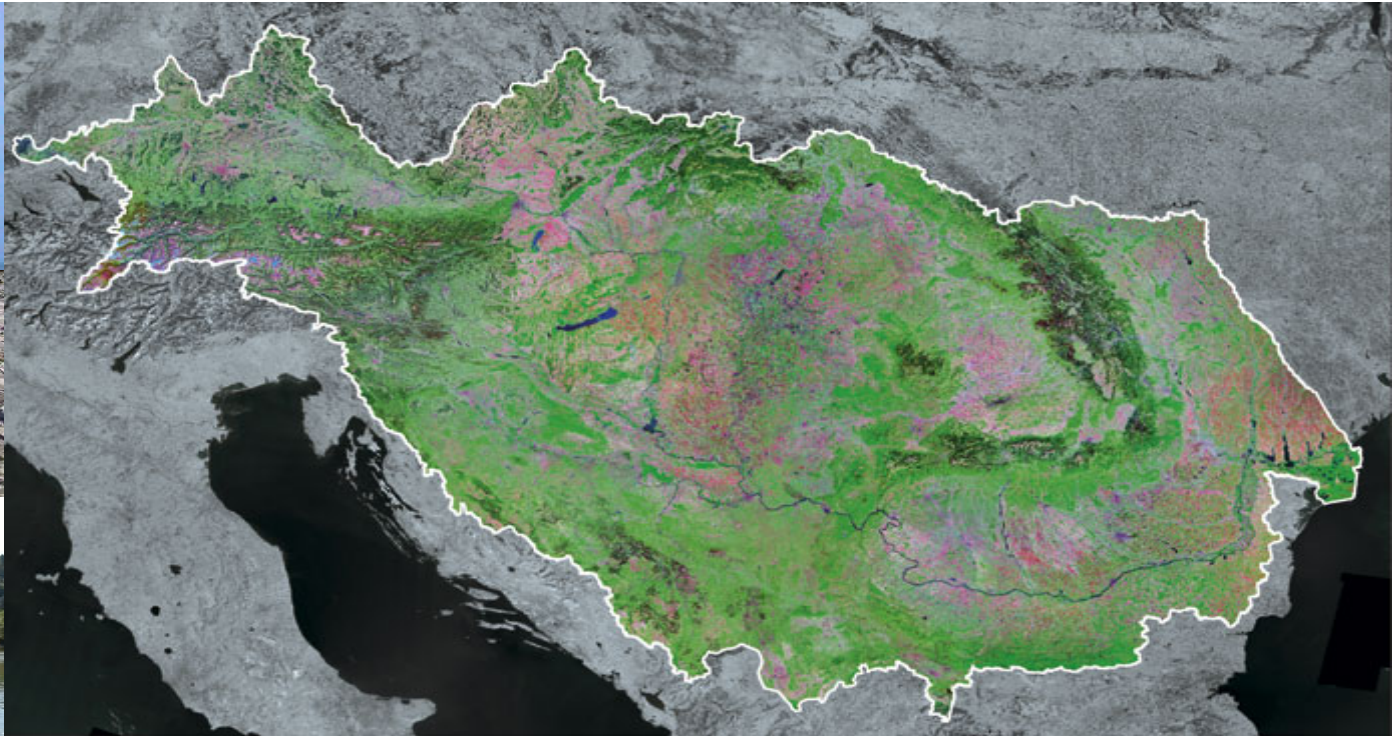


Danube River – the European Experience:

Inputs from the International Commission for the Protection of the Danube River

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II International Seminar on Revitalization of Rivers

Belo Horizonte – Minas Gerais – Brazil

Wolfgang Stalzer
ICPDR
Vienna (Austria)



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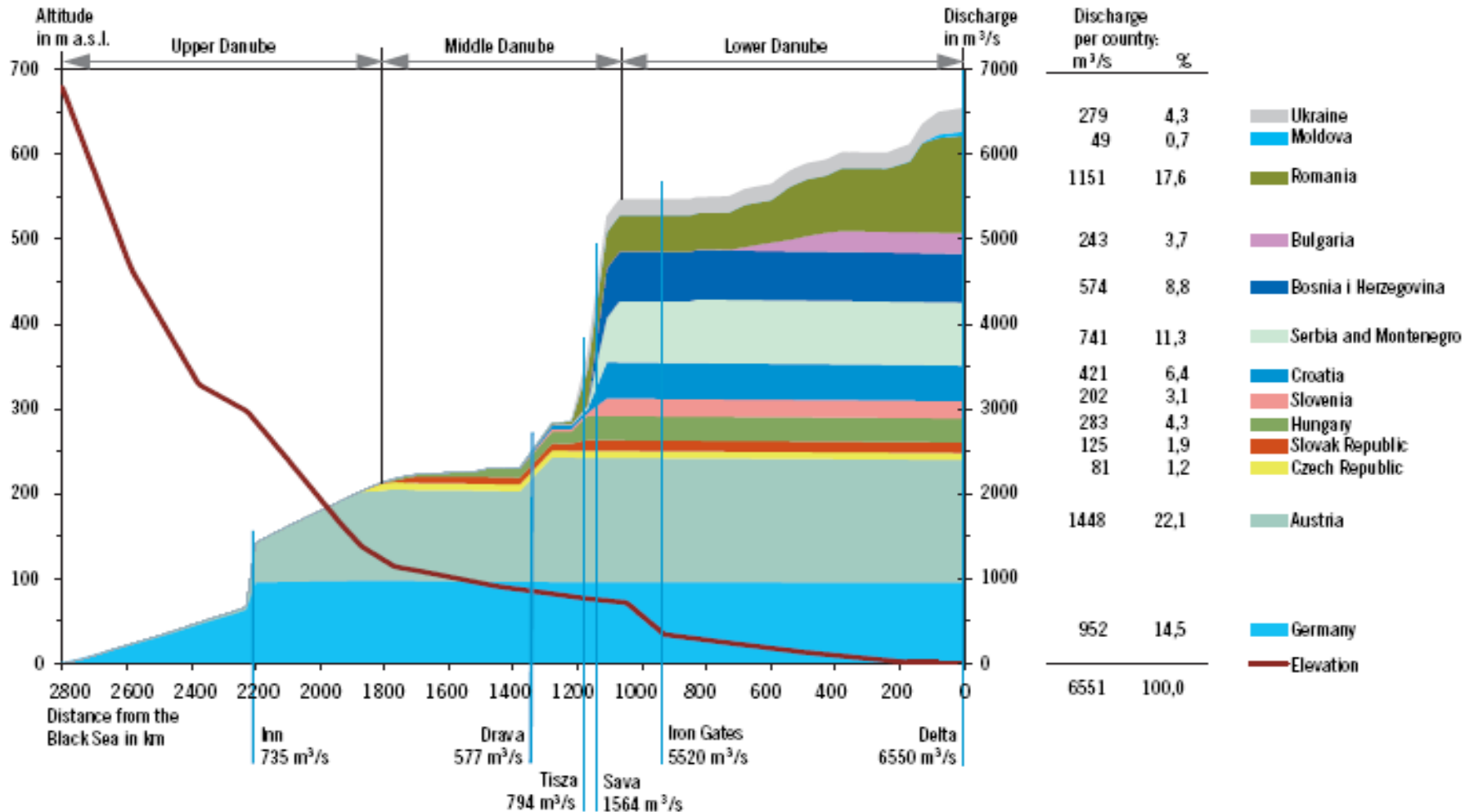
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- 81 M inhabitants
- 19 Countries
- 801 000 km²
- 9 % of Europe
- 2 850 km Length
- Main Tributary to the Black Sea

**Most
international
River Basin in the
World**

Longitudinal Profile of Danube and countries contributions to the cumulative discharge (%);

Large differences in water availability



Political Background 1945 – 1990 The Iron Curtain

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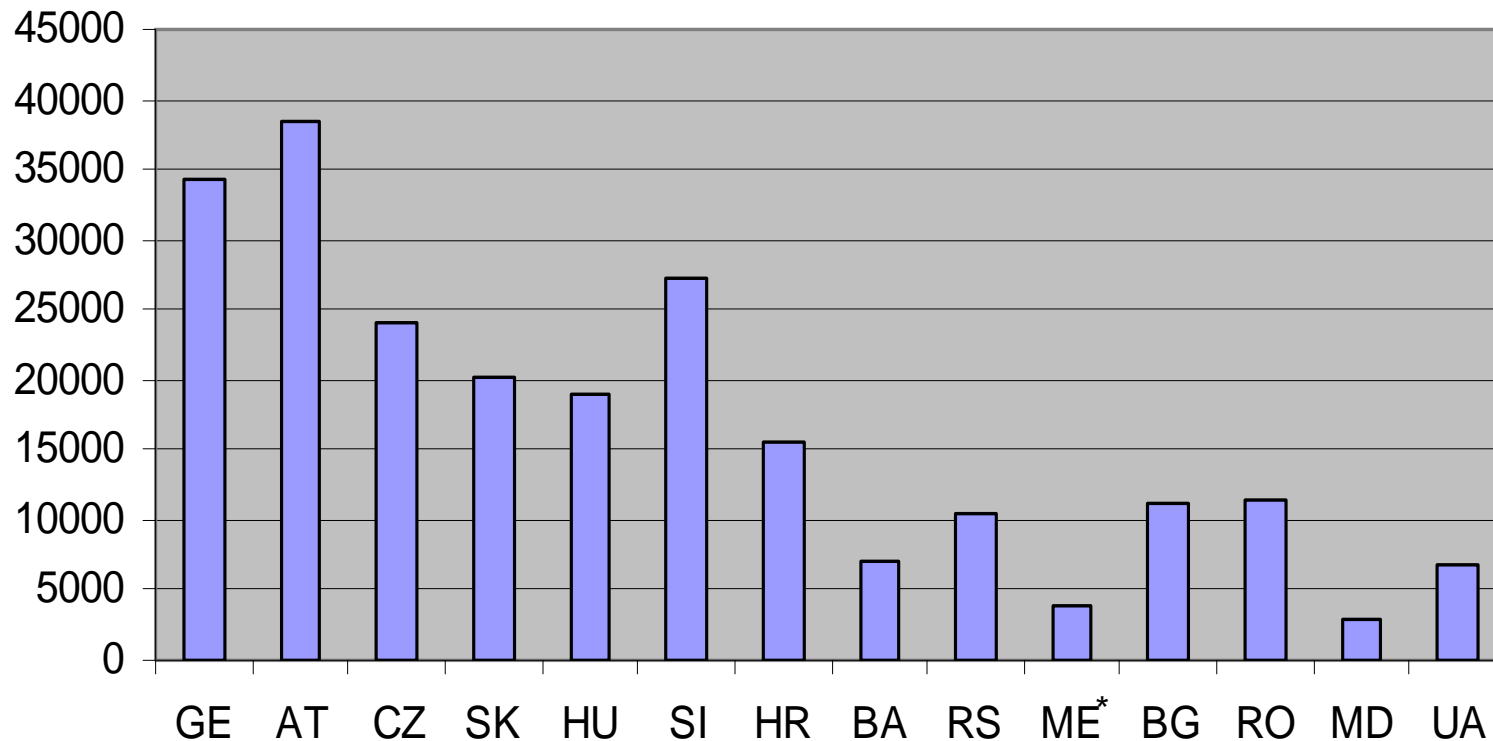
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Economic Disparities

GDP per capita (PPP) in \$, 2007



* 2005

European Lifeline - Benefits



- Drinking water
- Agriculture and livestock breeding
- Fisheries (4 400 t/a)
- Industry (e.g. mining, paper industry, chemical industry)
- Hydropower (28 500 GWh/a)
- Transport – navigation
- Tourism (White Fleet, Cycling)
- Recreation for local people
(Protected areas, such as National and Nature Parks)

International Cooperation in Water Management – the Begin



- 1948** Belgrade Convention (**Shipping Convention**):
Ratified by USSR, Bulgaria, Hungary, Romania,
Ukraine, CSSR, Yugoslavia, Austria and Germany
Improvement of navigation conditions for vessels of
all nations (flags of over 30 countries are registered)
- 1956** **International Association on Danube Research – IAD**
Exchange of scientific experience over the “Iron Curtain”
- 1965** **International Hydrological Decade (UNESCO/WMO)**
covering issues of hydrology, flood forecasts, riverine
regime, etc.

International Cooperation in Water Management

- 1985 **Bucharest Declaration** on Water Management in the Danube River
- assessment of water quality at “**border profiles**”
 - development of a water balance
 - exchange of experiences of flood protections and ice hazards

Danube River Management – after the collaps of the Iron Curtain



1989/90 Geopolitical changes in the region –
 Start of several environmental activities in the former
 COMECON-States

Environmental Activities

1991 Danube Conference in Sofia
 together with international donors and NGOs
 Launching the “**Environmental Programme for the
 Danube River Basin**”

Danube River Management

- Donor driven activities

“Environmental Programme for the Danube River Basin”

Main tasks:

- Regional **studies**, feasibility studies
- Preparation of the “**Strategic Action Plan (SAP)**”, 1994
introducing water pollution control strategies
- Implementation of the SAP via selected projects

Financial Requirement: 1992 – 2000

55 Mio. US \$ for the eligible states

Danube River Management - Donor driven activities

Danube Pollution Reduction Programme –

(funded through UNDP/GEF)

finished in 1999 with following **results**

- a knowledge base for **priority pollution loads**
- the **Danube Water Quality Model**
- the revised **Strategic Action Plan**
- a **project database** containing 421 projects
(192 municipal projects, 113 industrial projects, 67
agricultural projects, **29 wetland restoration projects** -
developed for financing institutions)

Danube River Management

- Donor driven activities

UNDP/GEF DANUBE REGIONAL PROJECT

2001 – 2006 Transboundary Cooperation between the
Danube River Basin – Black Sea

- Reduction of nutrient levels
- Reduction of toxic and hazardous substances
- Rehabilitation of wetlands
- Restoration of the Black Sea Ecosystem
- Support for the Implementation of River Basin Management (EU-WFD) in cooperation with the ICPDR
- Financial input: 17,24 Mio. US \$

International Cooperation in Water Management



Legal and administrative Activities

- 1992 UNECE “Helsinki”- Convention on the protection and use of transboundary watercourses and international lakes, covering the elements of water protection and water quality management
- 1994 Danube River Protection Convention
(signed in Sofia, Bulgaria June 29)
- 1998 Entering into force
Implementation through the International Commission for the Protection of the Danube River (ICPDR)
Establishment of the Secretariat at the Vienna International Centre

ICPDR - International Commission for the Protection of the Danube River



The ICPDR, established by the DRPC:

- ➔ has the mandate to ensure conservation, improvement and rational use of surface waters and ground water
- ➔ reduce inputs of nutrients and hazardous substances
- ➔ control floods and ice hazards
- ➔ reduce pollution loads to the Black Sea

Since 2000 the ICPDR is the coordinating body for implementing the EU Water Framework Directive in DRB

Contracting Parties



- Germany



- Austria



- Czech Republic



- Slovakia



- Hungary



- Slovenia



- Croatia



- Bosnia & Herzegovina



- Serbia



- Montenegro



- Romania



- Bulgaria



- Rep. of Moldova



- Ukraine



- European Union

Observers to the ICPDR



viadonau/



VGB Power Tech



GWP CEE



Statute of the Commission:

Composition: 5 delegates/contracting party

Presidency: chair turns every year

Ordinary Meetings: once per year

Decision making: consensus
or four-fifth majority

Working language

ICPDR –Financial Rules

Financial rules:

- Annual budget (only the administrative costs are carried by the Commission)
- Contributions in equal parts (except EU .. 2,5 %)
- Contracting parties have to pay the expenses for participation of delegates, expert, etc.
- Contracting parties have to carry costs of current monitoring and assessment activities
- Auditing

ICPDR – Organisation Structure



EU – Water Framework Directive – the driving force in the Danube Basin



Goals and obligations

- River basin management
- Coordination of objectives
- Good status for all water bodies

Ecological protection

Chemical protection

- Coordination of measures
- River Basin Management Plan
- Public participation

ICPDR – Results

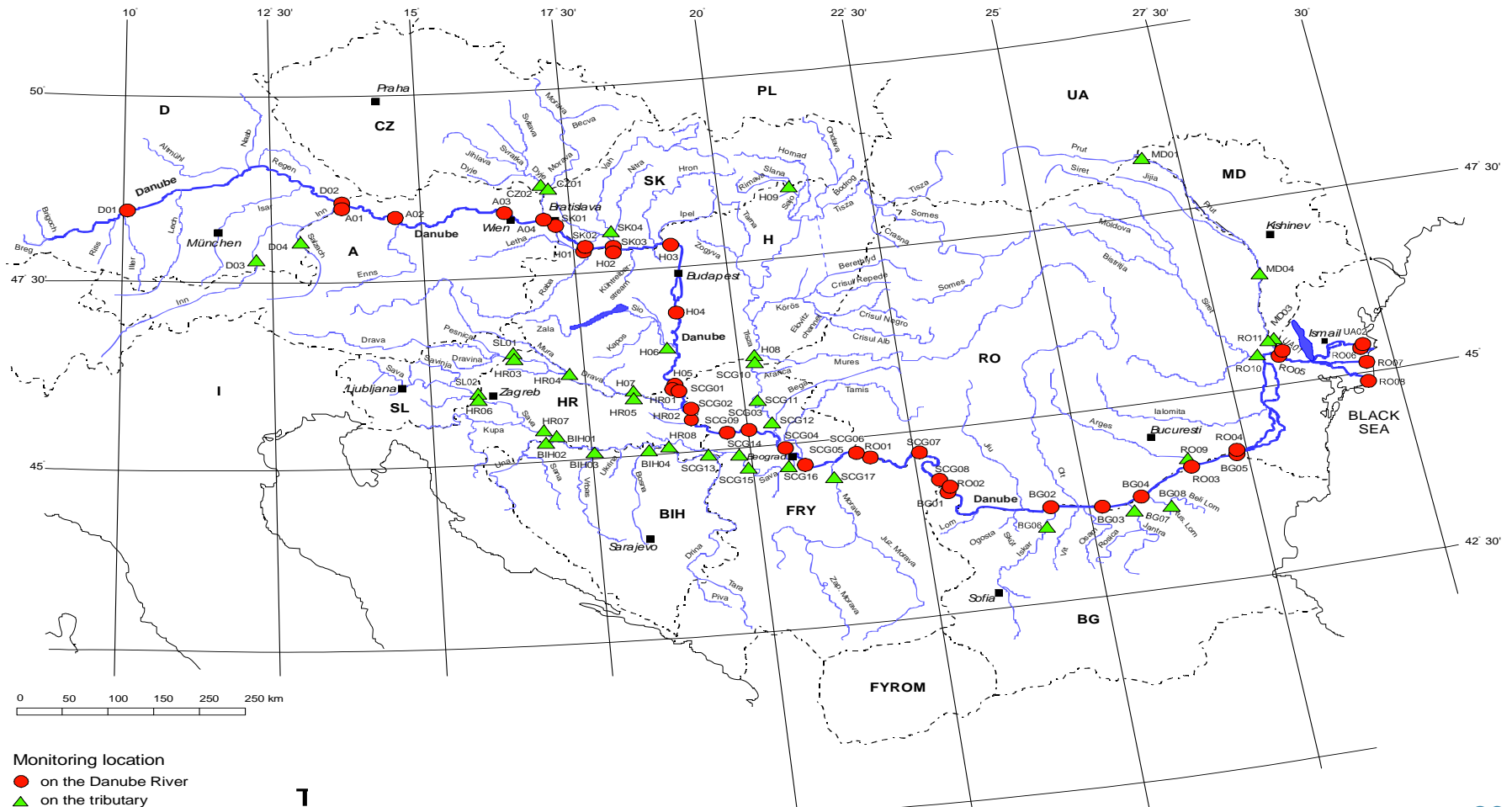
- Transnational Monitoring Network System (TMNS)
- Accidental Prevention and Emergency Warning System (APEWS)
- Strategic Action Plan (SAP)
- Danube River Analysis
- River Basin Management Plan (RBM)
- Flood Action Plan

Trans National Monitoring Network - TNMN

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Danube Basin Analysis 2004

The Danube River Basin District

River basin characteristics, impact of human activities and economic analysis required under Article 5, Annex II and Annex III, and inventory of protected areas required under Article 6, Annex IV of the EU Water Framework Directive (2000/60/EC)

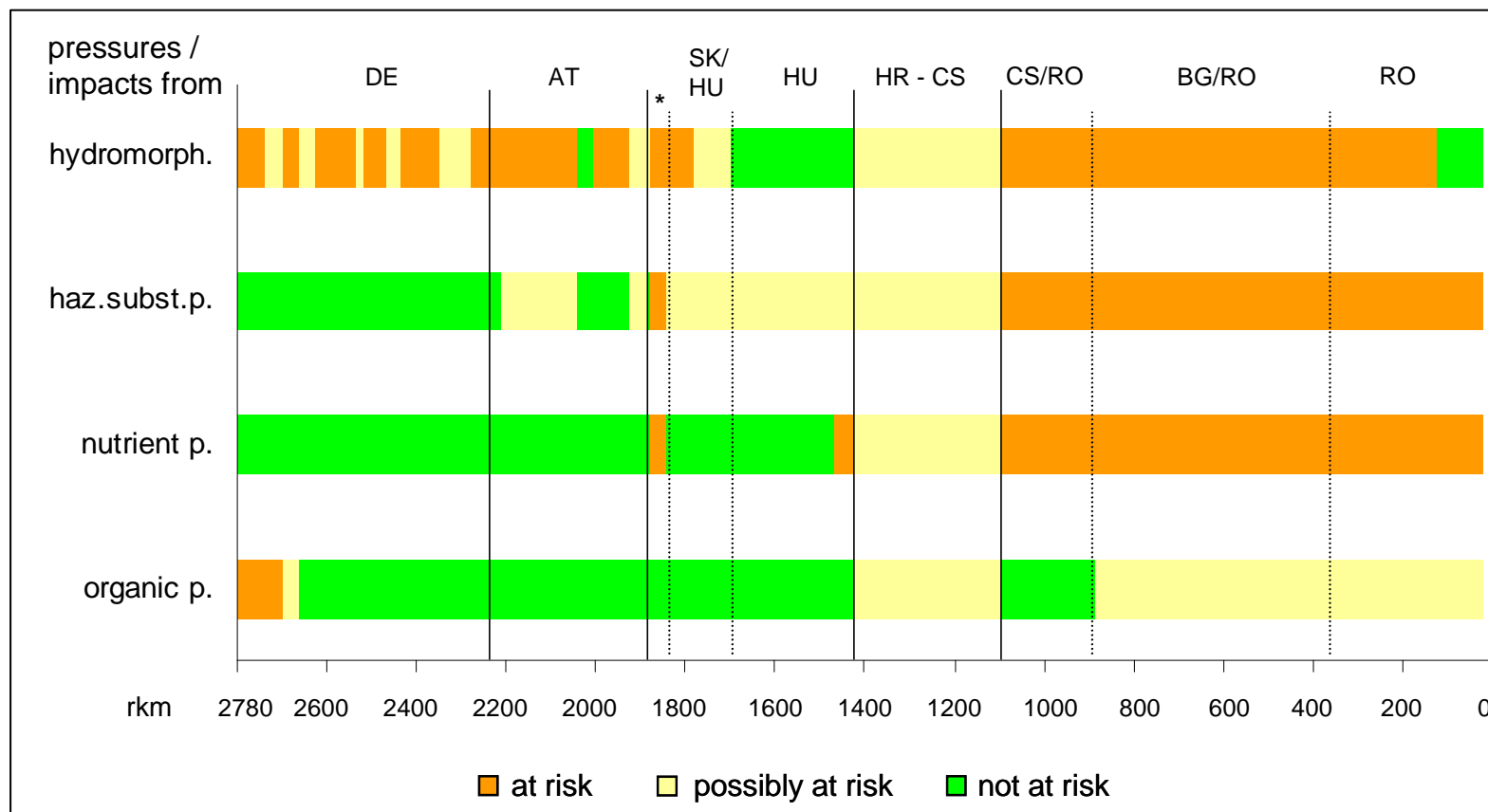
Part A – Basin-wide overview

Short: "Danube Basin Analysis (WFD Roof Report 2004)"

- ⇒ First comprehensive analysis of the entire Danube River Basin
- ⇒ Basis for any future river basin management planning
- ⇒ Identification of significant water management issues

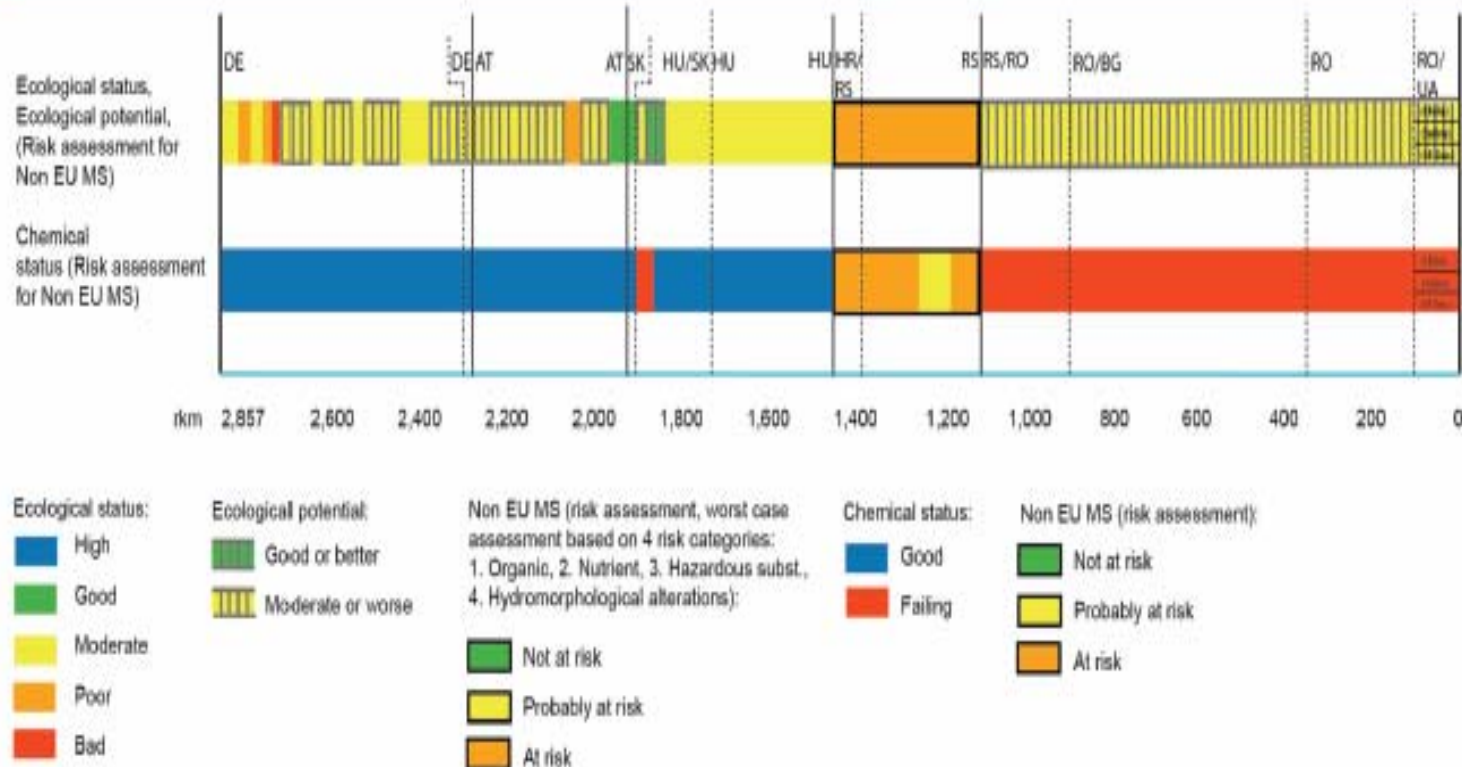
The complete report consists of Part A: Basin-wide overview, and Part B: Detailed analysis of the Danube river basin countries
18 March 2005, Reporting deadline: 22 March 2005

Identification Significant Water Management Issues 2001



Danube – Qualitystatus 2009

Figure 25: Status classification for the Danube River represented as continuous bands.



Danube River Basin Management (DRBM) Plan



- ⇒ **First time and unique overview on basin-wide issues**
 - ⇒ Transboundary EU Water Framework Directive (WFD) implementation for largest international river basin district
 - ⇒ Pressures/impacts for all significant water management issues (SWMIs)
 - ⇒ Basin-wide analysis on wastewater treatment
 - ⇒ Nutrient management on a large scale
 - ⇒ HYMO alterations – first time overview
- ⇒ **Large scale data collection based on DanubeGIS**

Is a 'heartpiece' of the DRBM Plan that outlines

- ⇒ Visions and management objectives for each SWMI
- ⇒ Way toward the management the environmental objective

2015

- ⇒ Measures that need to/will be taken on basin-wide scale

JPM Key Conclusions are part of it

DRBM Plan

SWMIs – Key Results



Organic
Pollution



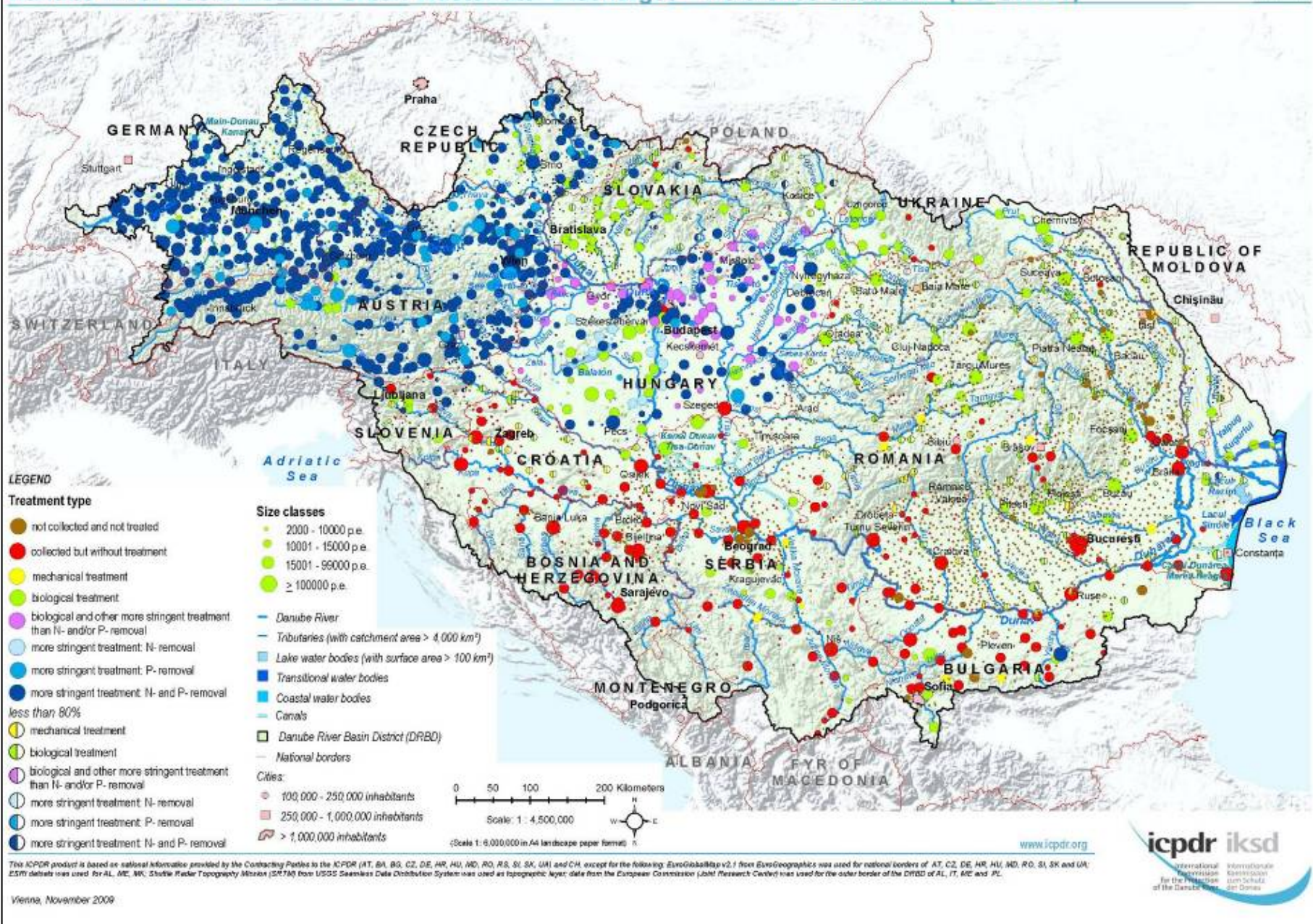
Nutrient
Pollution



Hazardous
Substances Pollution



Hydromorphological
Alterations





Organic
Pollution

Basic Facts

Reference Situation:

- ⇒ **6,224 agglomerations > 2,000 PE** in the DRB:
 - ⇒ 2,000 – 10,000 PE: 4,969 agglomerations
 - ⇒ > 10,000 PE: 1,255 agglomerations
- ⇒ Many agglomerations without wastewater treatment or sewerage connection
 - ⇒ No wastewater collection: more than 2,900 aggl.
= 12.6% of the generated load

Scenarios used as tool for indication 2015 and beyond



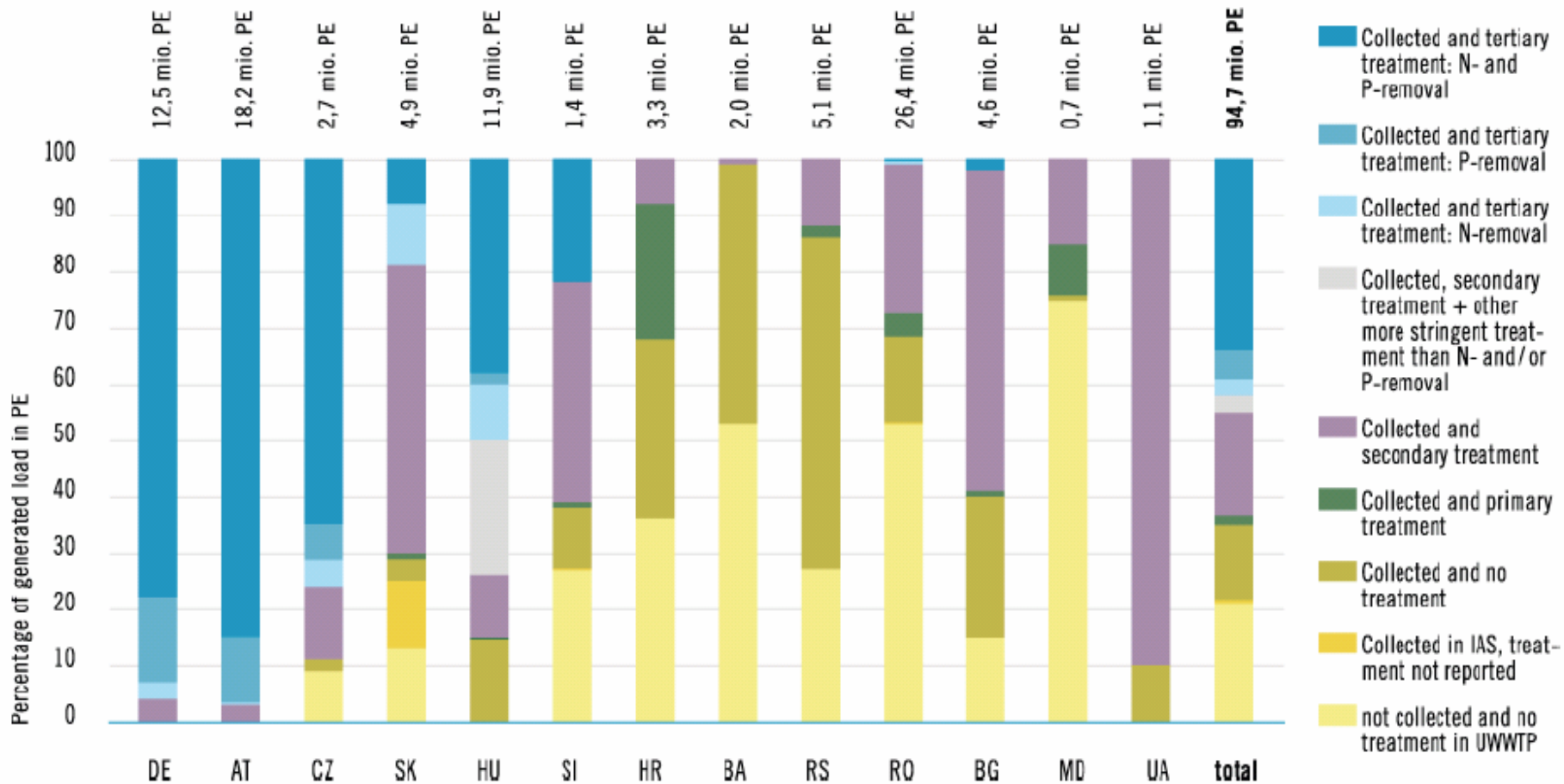
Organic
Pollution

Organic Load

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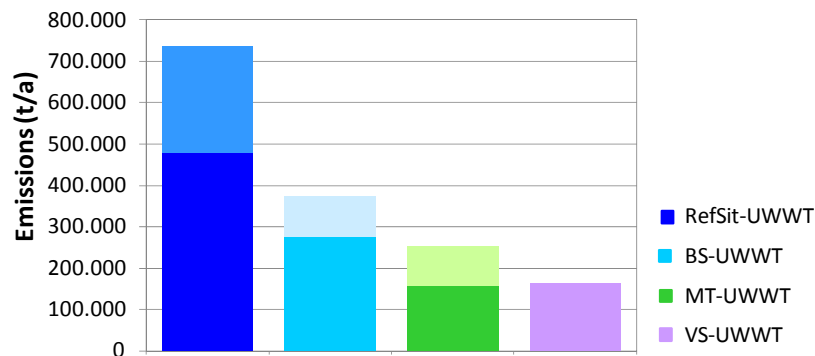


Organic
Pollution

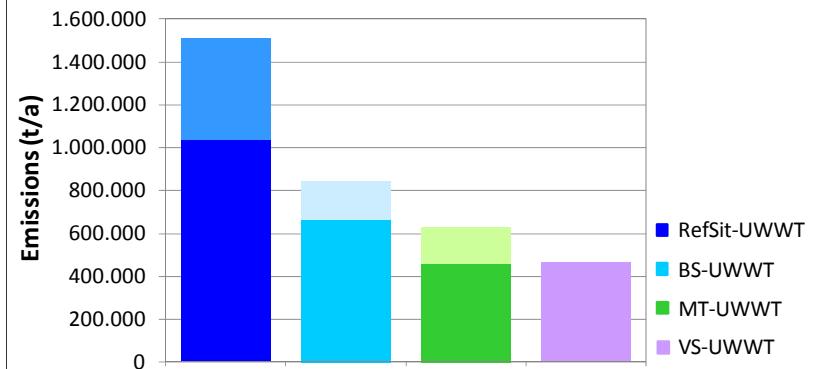
BOD₅ and COD emissions

- ⇒ BOD₅ and COD emissions – different scenarios
 - ⇒ Reference situation
 - ⇒ Baseline Scenario-UWWT 2015
 - ⇒ Midterm Scenario-UWWT (beyond 2015)
 - ⇒ Vision Scenario-UWWT (beyond 2015)

BOD₅ - emissions



COD - emissions





Organic
Pollution

Key Conclusions

- ⇒ **Considerable reduction** through measures of
Baseline Scenario-UWWT to be implemented by 2015 but
achievement of WFD environmental objectives on the
basin-wide scale 2015 not ensured
- ⇒ Significant efforts still need to be undertaken
for next RBM cycles



Nutrient Pollution

Longterm Change of the Nutrient Load

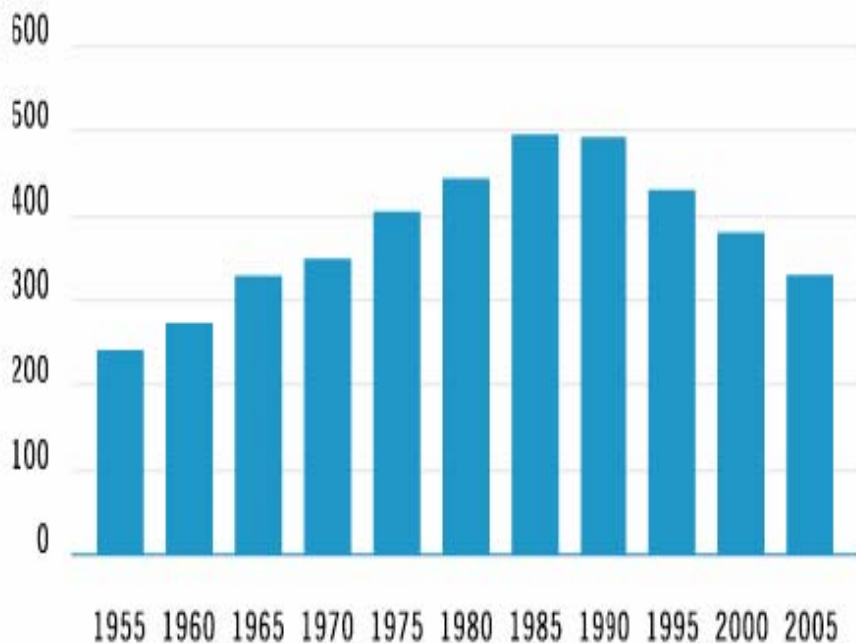
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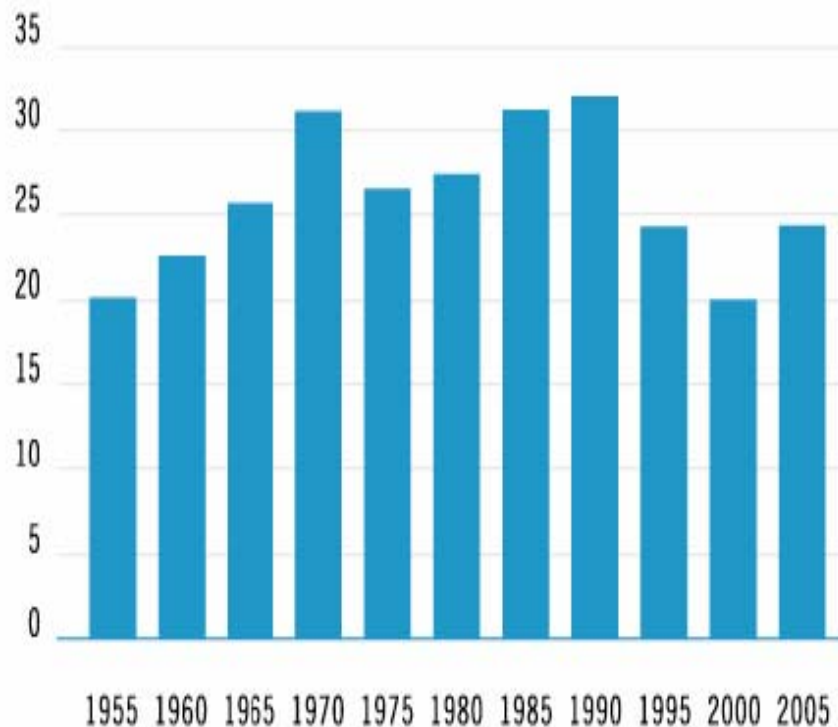
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Figure 5: Long-term discharges of dissolved inorganic nitrogen (DIN) and total phosphorus (TP) (1955-2005).

DIN load in kt/year



TP load in kt/year





Nutrient
Pollution

Different Scenarios - Nutrients

- **Overall Baseline Scenario – Nutrients 2015**
- **Baseline Scenario Agriculture – Nutrients 2015**
 - Moderate agricultural development
 - Agreed measures to reduce nutrients
 - Future NOx deposition
- **Agricultural Scenarios-Nutrient 2015**
 - Intensified agricultural development
- **Phosphate Ban Scenario**
 - Considers P ban in laundry detergents and dishwashers



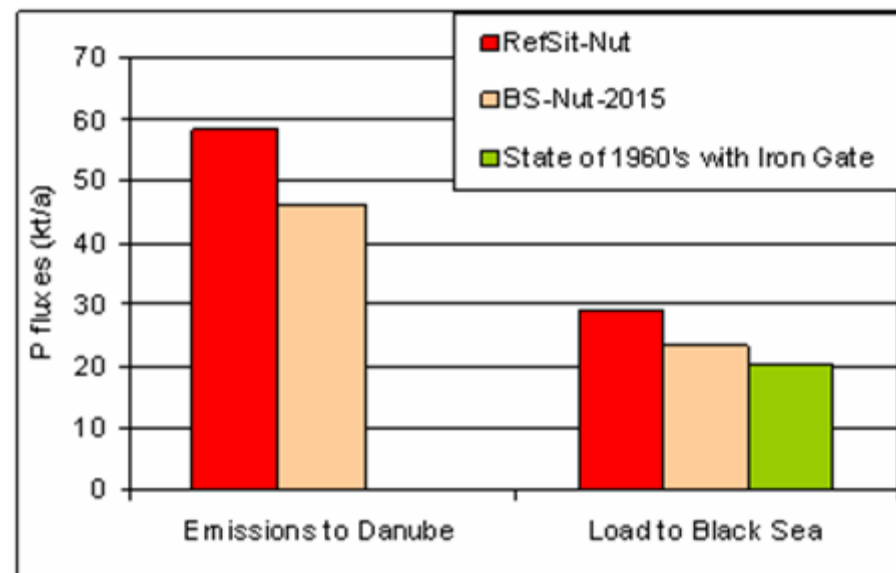
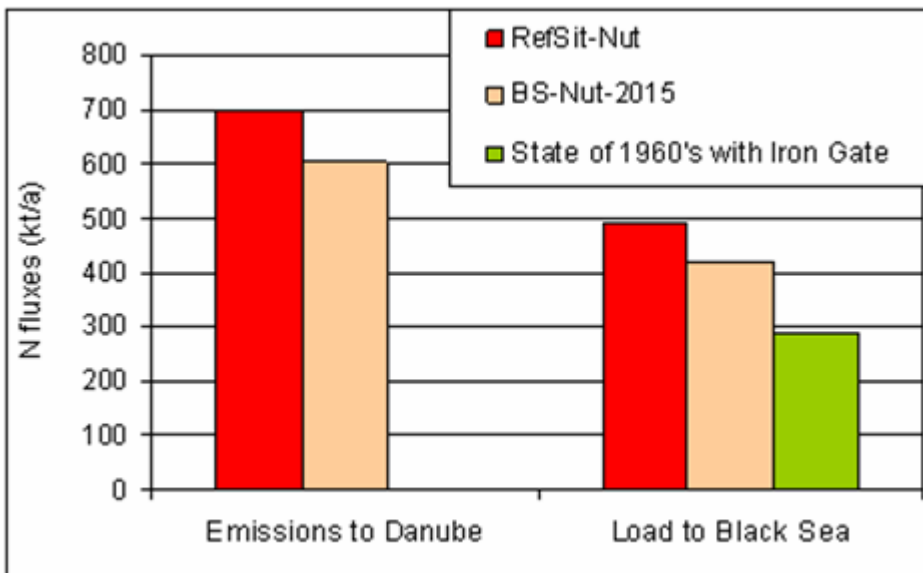
Nutrient
Pollution

Different Scenarios N & P Emissions and Loads Reference – Baseline 2015



Nitrogen
686 kt/a

Phosphorous
58 kt/a





Nutrient Pollution

Key Conclusions

- **N emissions** to surface waters in 2015: 602 kt/a = 12% lower than 2009.
- Load to the Black Sea: Below present state but still far above (40%) that of the 1960's.
- Management objectives and EU WFD objectives not ensured by 2015
- **P emissions** to surface waters in 2015: 46 kt/a = 21% lower than 2009.
- Load to the Black Sea: Below present state but still above (15%) that of the 1960's
- Management objective will not be achieved by 2015 and this is most likely also the case for the WFD environmental objectives
- Introduction of limitations on P in detergents is seen as a cost effective and necessary measure



Hazardous Substances Pollution

- ⇒ Based on EPER (EU MS) and ICPDR Emission Inventory data
 - ⇒ to be improved end 2009 (but not part of DRBM Plan)
- ⇒ EU IPPC and other Directives key instruments for reduction
- ⇒ Lack of knowledge on sources , pathways and losses of hazardous substances on the basin-wide scale
- ⇒ Estimation that management objectives and EU WFD environmental objectives will not be achieved in 2015
- ⇒ Further measures needed
- ⇒ There is a need for more monitoring data and information on sources of hazardous substances



Hydromorphologic
al

Alterations

4 HYMO Components

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River and Habitat Continuity Interruption

Disconnection of Adjacent Wetlands/Floodplains

Hydrological Alterations

Future Infrastructure Projects

Key Drivers

⇒ Navigation

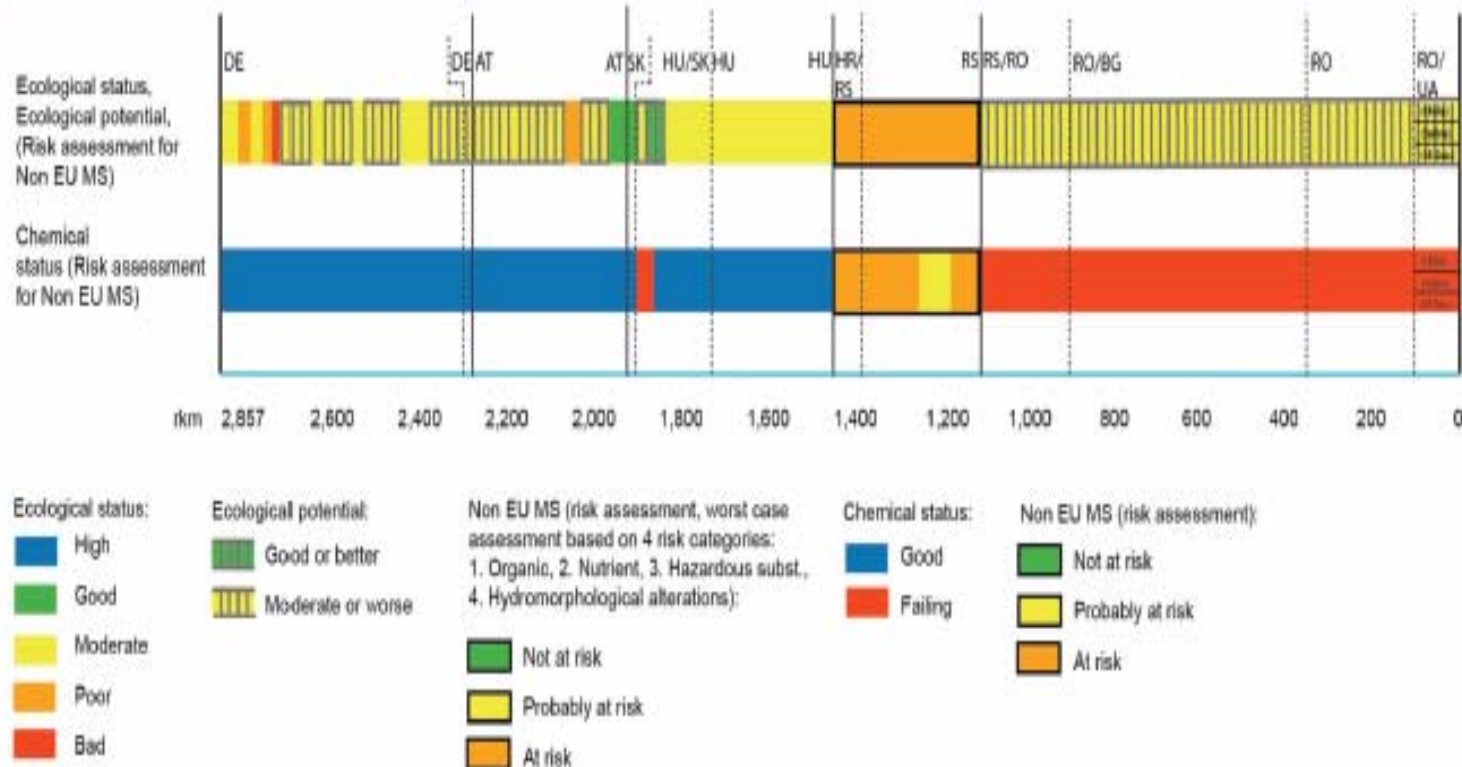
⇒ Hydropower generation

⇒ Flood protection

⇒ Water supply

Danube – Qualitystatus 2009

Figure 25: Status classification for the Danube River represented as continuous bands.





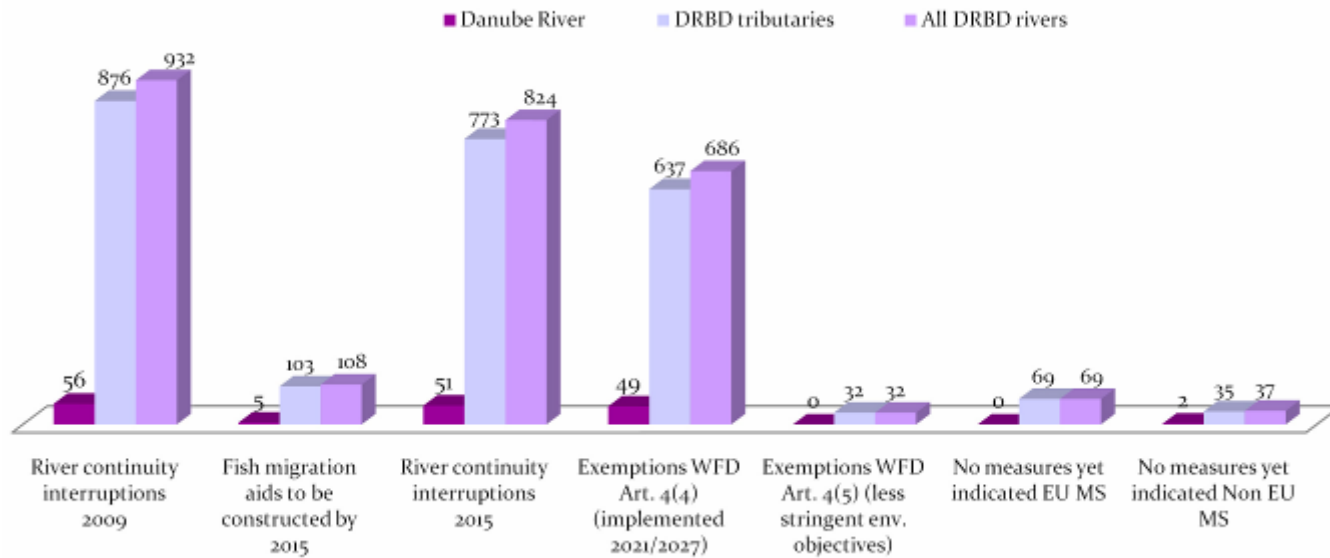
Hydromorphological

River and Habitat Continuity Interruption

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- 108 migration aids constructed by 2015; 824 remain continuity interruptions in 2015
- 686 continuity interruptions will be addressed by 2021/2027
- Achieve the WFD environmental objectives in an ecologically effective way: initial measures should focus on the defined ecological priority river stretches.
- Perform feasibility study on the re-opening of the Iron Gate Dams



Ecological prioritisation approach for basin-wide measures for river continuity



- ⇒ Should ensure free fish migration in DRB
- ⇒ Classification of fish regions in DRB
- ⇒ List and map of key migration routes of medium and long distance migratory fish species
- ⇒ Prioritisation index for measures based on agreed criteria
- ⇒ Map illustrating prioritisation index and therefore measure priority



Sturgeon



Danube Salmon



This prioritisation approach (Part A) is not meant to substitute similar national approaches but to outline the basin-wide perspective. Low restoration priority indicated on the basin-wide level does not imply that no measures are needed on the national level as all fish species need open river continuity. On the other hand, ecological prioritisation is only one of many aspects in deciding which measures to adopt and implement. Final decisions will be made at the national level. CE is currently leading a national prioritisation concept for river continuity restoration. Five continuity interruptions will be made possible for fish by 2015 and will be displayed in the national RDM Plan. Please those interruptions are respectively indicated and illustrated as "Continuity restored by 2015/2021".

This product is based on national information provided by the Contracting Parties to the ICPR (AT, BG, CZ, DE, HR, HU, MD, RO, RS, SI, SK, UA) and CH, except for the following: EuroGlobeMap v2.1 from EuroGeographics was used for national borders of AT, CZ, DE, HR, HU, MD, RO, SI, SK and UA; SRTM30 PLUS was used for AL, ME, MK; Shuttle Radar Topography Mission (SRTM) from USGS Seamless Data Distribution System was used as topographic layer; data from the European Commission (Joint Research Centre) was used for the outer border of the DRBD of AL, IT, ME and PL.

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International Scientific Group on Danube

Danube – Hydropower, Freudenau Fichladder

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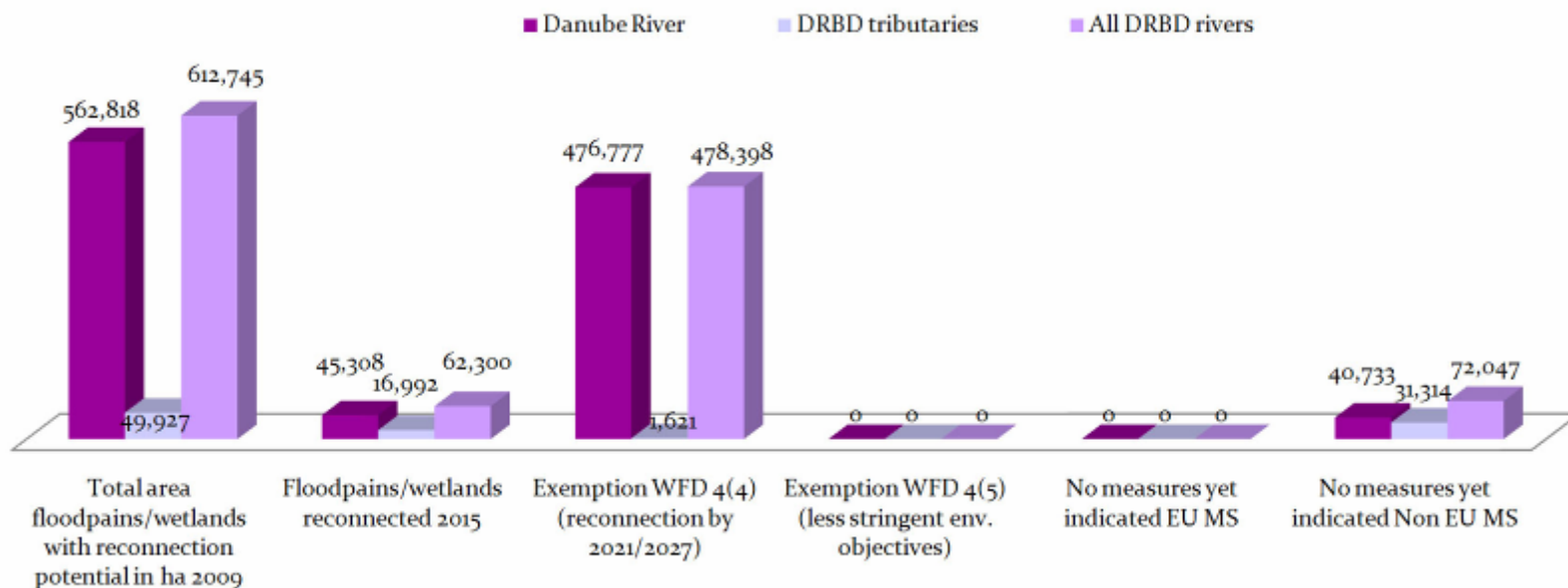
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Disconnection Wetlands/Floodplains

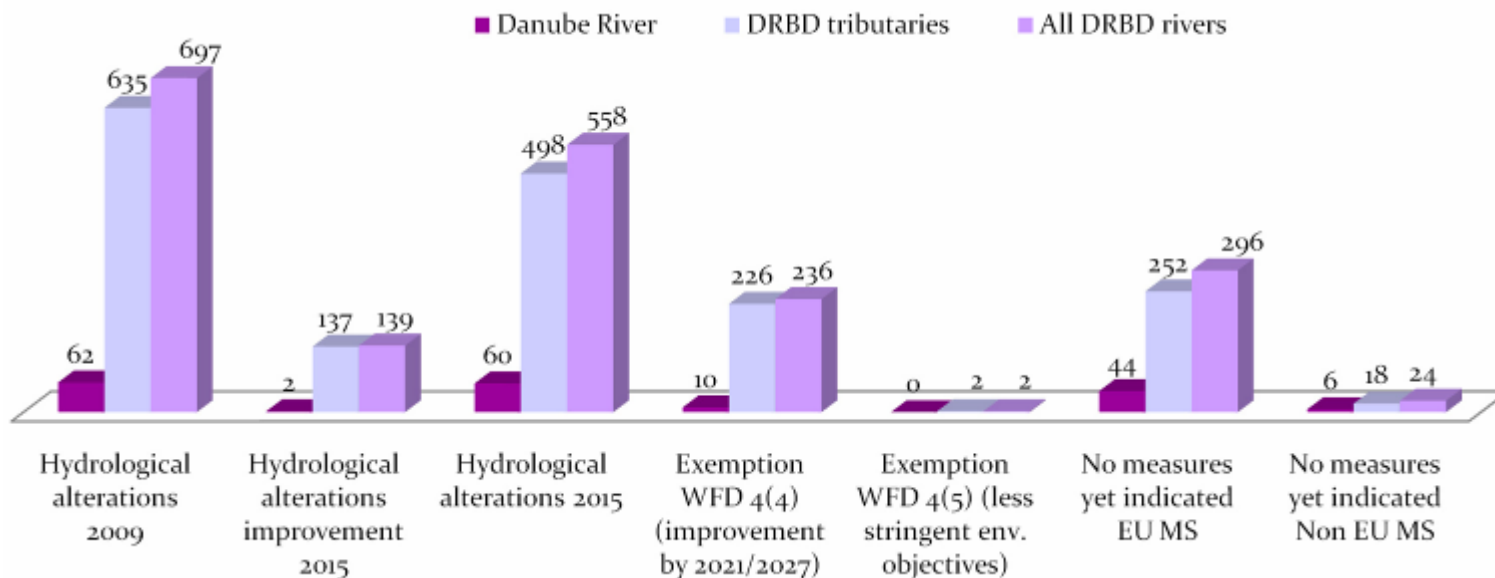


- 612,745 ha of wetlands/floodplains with reconnection potential
- 62,300 ha reconnected and/or the hydrological regime improved by 2015
- Difficult to indicate currently the effect of measures on basin-wide scale



Hydromorphological

Hydrological Alterations



- 697 hydrological alterations in DRBD as of 2009
- 139 measures will be taken to improve the ecological status of water bodies
- 236 hydrological alterations will be addressed by 2021/2027
- Difficult to indicate currently the effect of measures on basin-wide scale

Danube – Bankreinforcement

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River Bank Restoration Pilot Project Thurnhaufen

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BEST LIFE Nature
Project 2007-2008



AWARD

Best LIFE-Nature Project



<http://ec.europa.eu/life>



Reconnection of Side Arms

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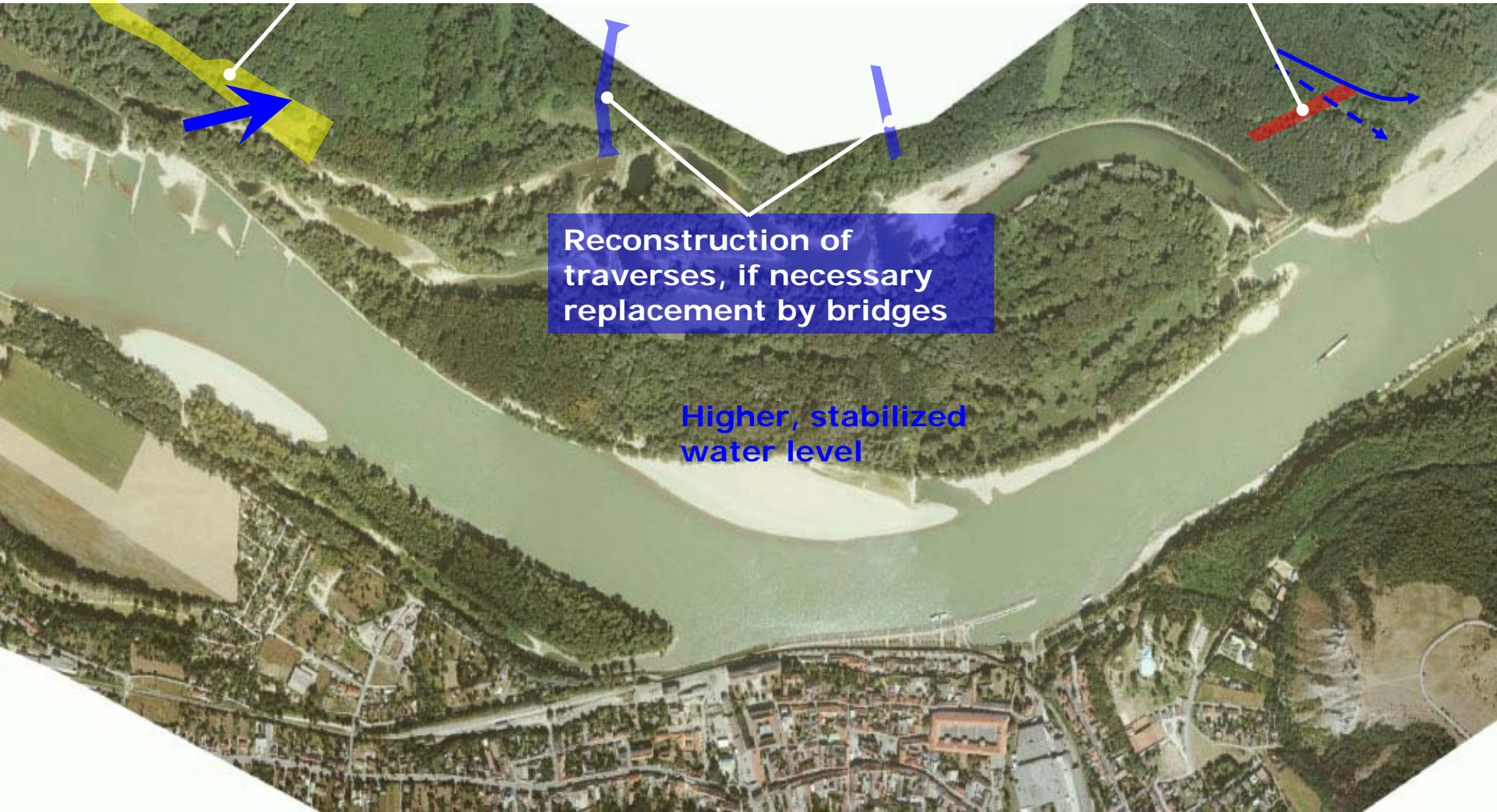
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Construction of
out-flows

Restoration of river banks
construction of in-flows

Reconstruction of
traverses, if necessary
replacement by bridges

Higher, stabilized
water level



Danube - Wetlandrestoration

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Wetland - Interconnection



Verkläuser von Durchlässen

Neue Bauweise GV
Schönau



River Bank Restoration Pilot Project Witzelsdorf

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after MW+1,15

Drau-Kleblach, Floodprotection – Bedenlargement

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1999

2009 56

Riverbederosion – Bodenlargement Austria Drau Sachsenburg



1998

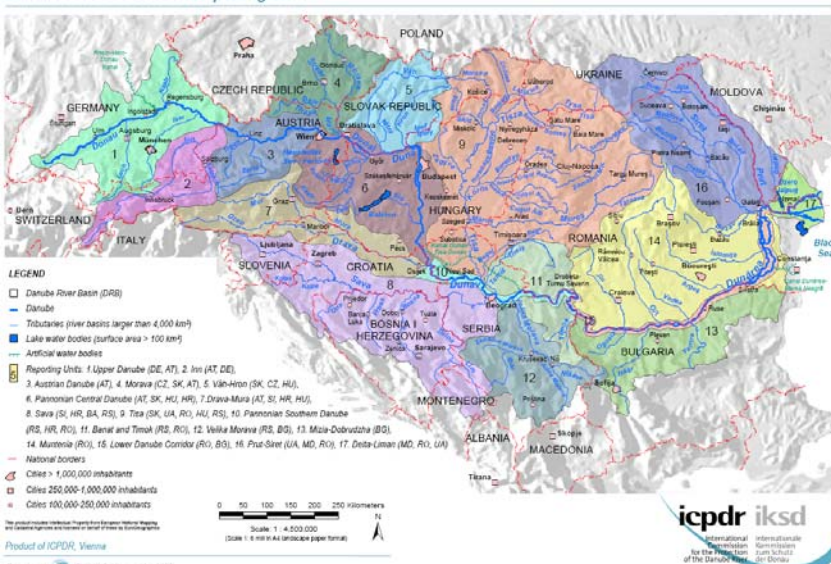


2002 **57**

Flood Protection: Action programme & plans



Danube Flood Protection Reporting Units



Action Programme on Sustainable Flood Protection in the Danube River Basin adopted in 2004;

17 flood action plans for the sub-basins in the Danube catchment area prepared in 2009 based on 45 national plans;

FAP lists hundreds of measures the Danube countries are going to take to keep their citizens safe against the flood danger.

Awareness Raising, Education, and Consultation

Danube Box

Teacher's handbook
Interactive CD-ROM, working
sheets, poster, family cards
National languages and English
www.danubebox.org



Next Steps



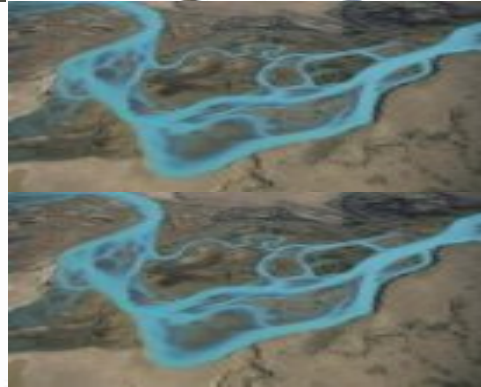
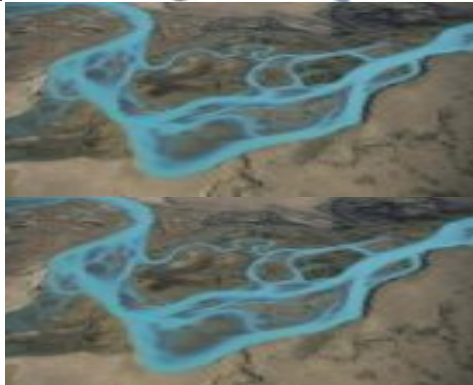
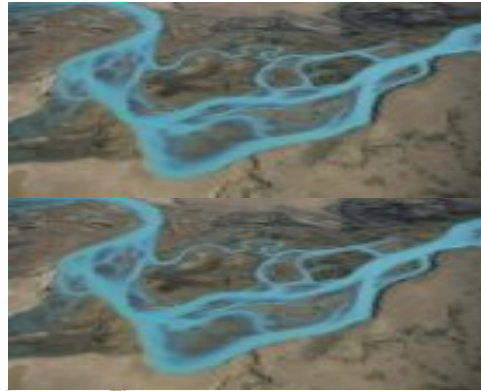
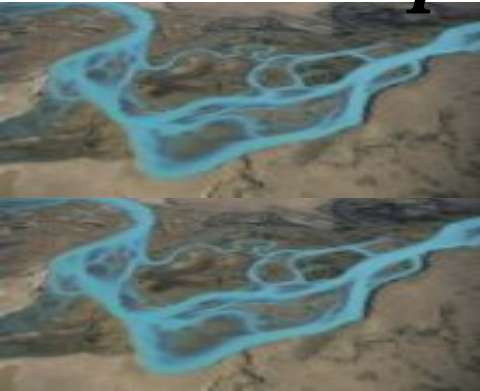
- Implementation of joint measures according to the Danube River Basin Management Plan
 - by 2012
- Evaluation of the measure implementation success
 - by 2015
 - to achieve the basin-wide management objectives
- Integration of Danube basin-wide findings into the overall EU context of the Danube Strategy

Thank you for the attention!

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Investments and expected results

Investments:

» Municipal wastewater collection & treatment	3.709 bill USD
» Industrial waste water treatment	0.276 bill USD
» Agricultural projects and land use	0.113 bill USD
» Rehabilitation of wetlands	0.323 bill USD

Nitrogen reduction:

» from point sources	58,600 t/y
» from diffuse sources	60,000 t/y
» total emission reduction:	22 %

Phosphorus reduction:

» from point sources	12,000 t/y
» from diffuse sources	4,000 t/y
» total emission reduction	33 %