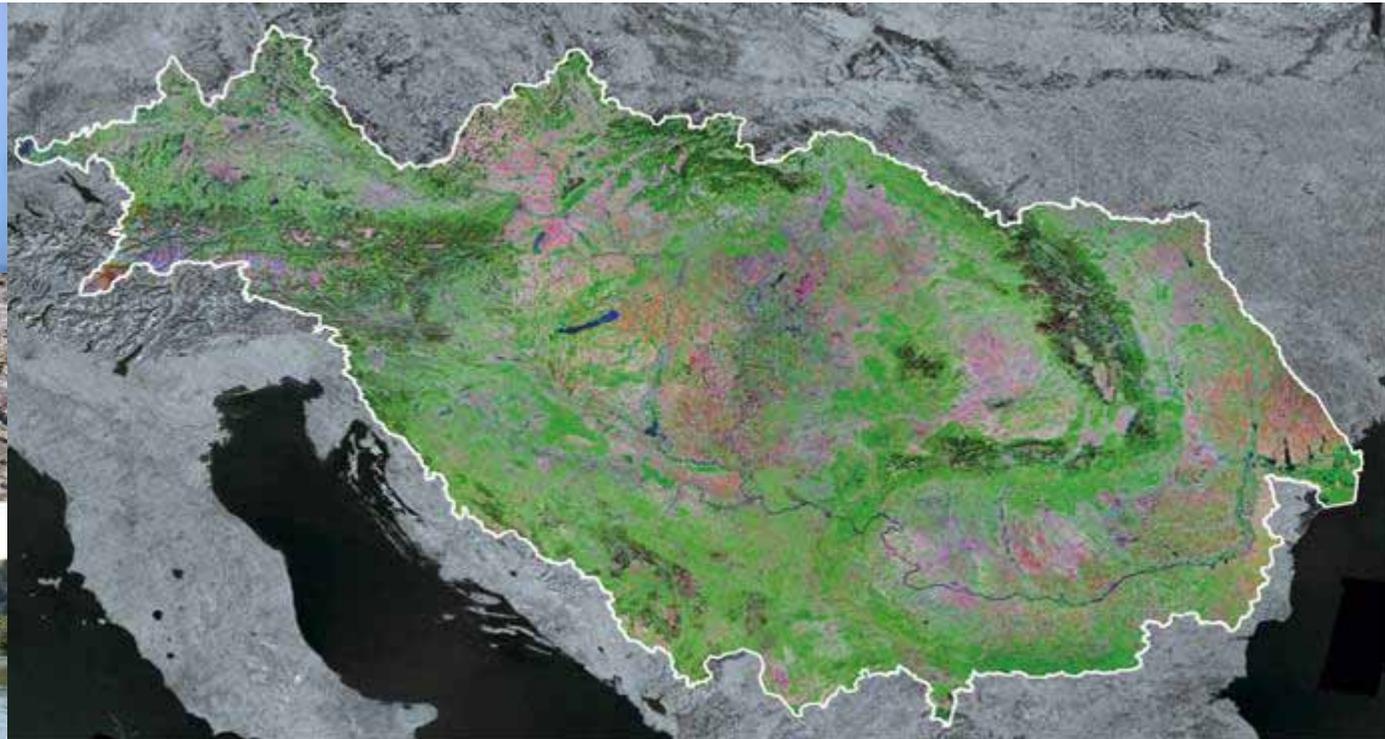


# Danube Basin Analysis: Pressure/Impact Assessment as Basis for Future Danube River Basin Management



**Joint Statement on Inland Navigation  
and Environmental Sustainability DRB  
25-26 April 2007, Orth/Donau (AT)**

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ICPDR**

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# CONTENT

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- ⇒ WFD & DRBM Plan
- ⇒ Danube Basin Analysis
  - ⇒ Basic Approach
  - ⇒ Results
  - ⇒ Hydromorphological Alterations/Navigation
- ⇒ Future Steps towards DRBM Plan/JPM

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# EU WFD & Danube River Basin Management Plan

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# ICPDR – River Basin Management

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## EU Water Framework Directive

- ⇒ implementation = highest priority
- ⇒ obligatory for all EU MS
- ⇒ obligatory for all EU Accession Countries
- ⇒ all other Danube states committed themselves to implement (Sofia, December 2000)



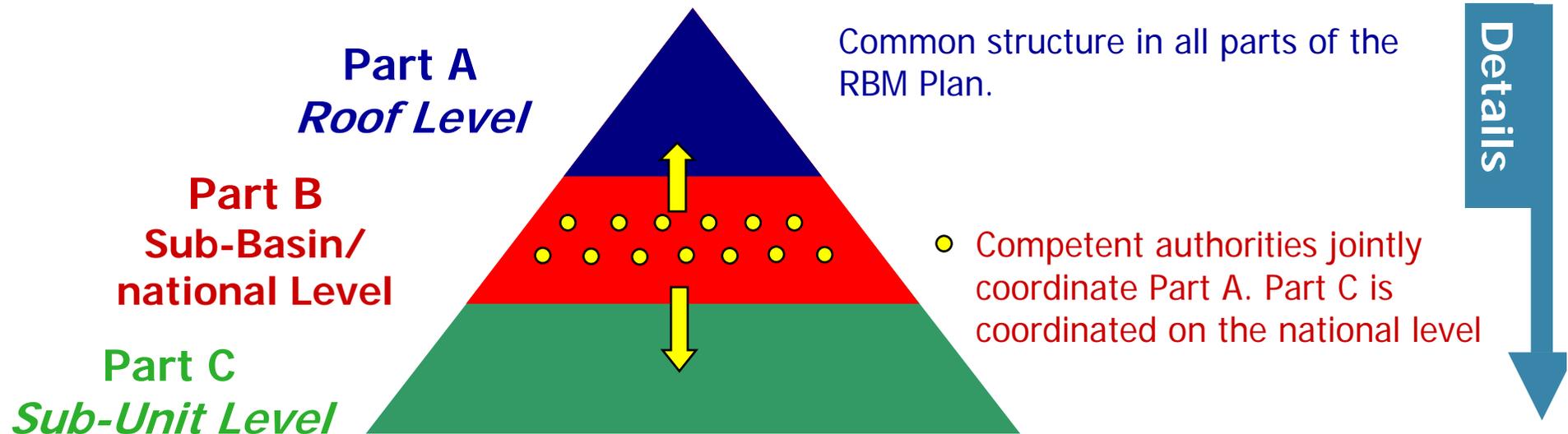
## Objectives Danube River Protection Convention

# Danube River Basin Management Plan

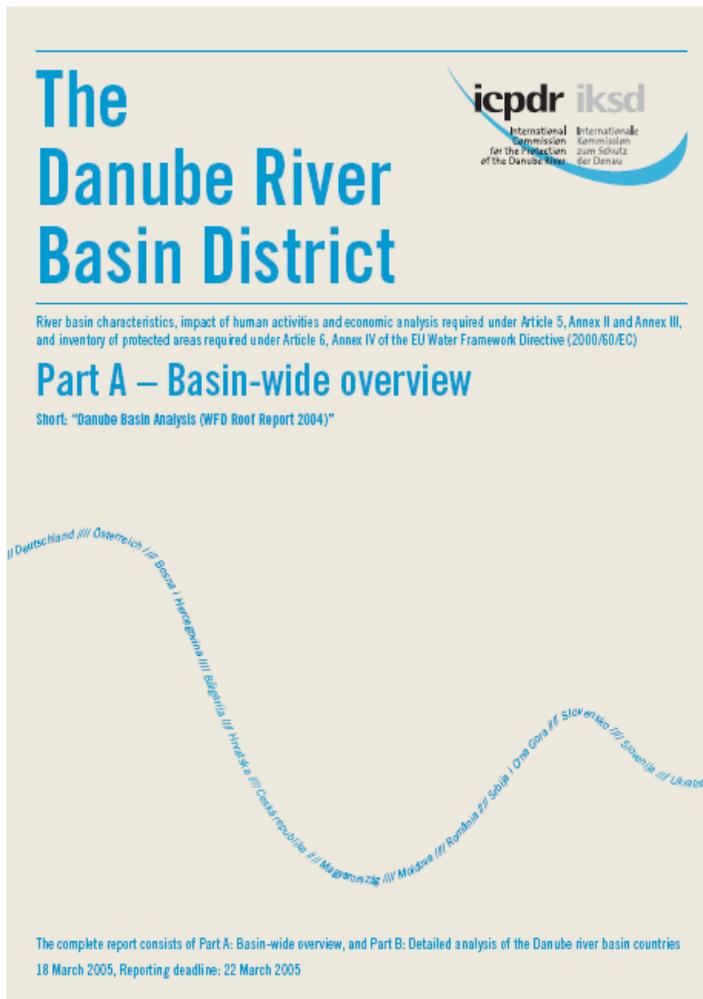


.....has to be compiled by 2009/10

good coordination mechanisms and a clear strategy including timelines are needed



# Danube Basin Analysis 2004



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

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# Content

## Danube Basin Analysis

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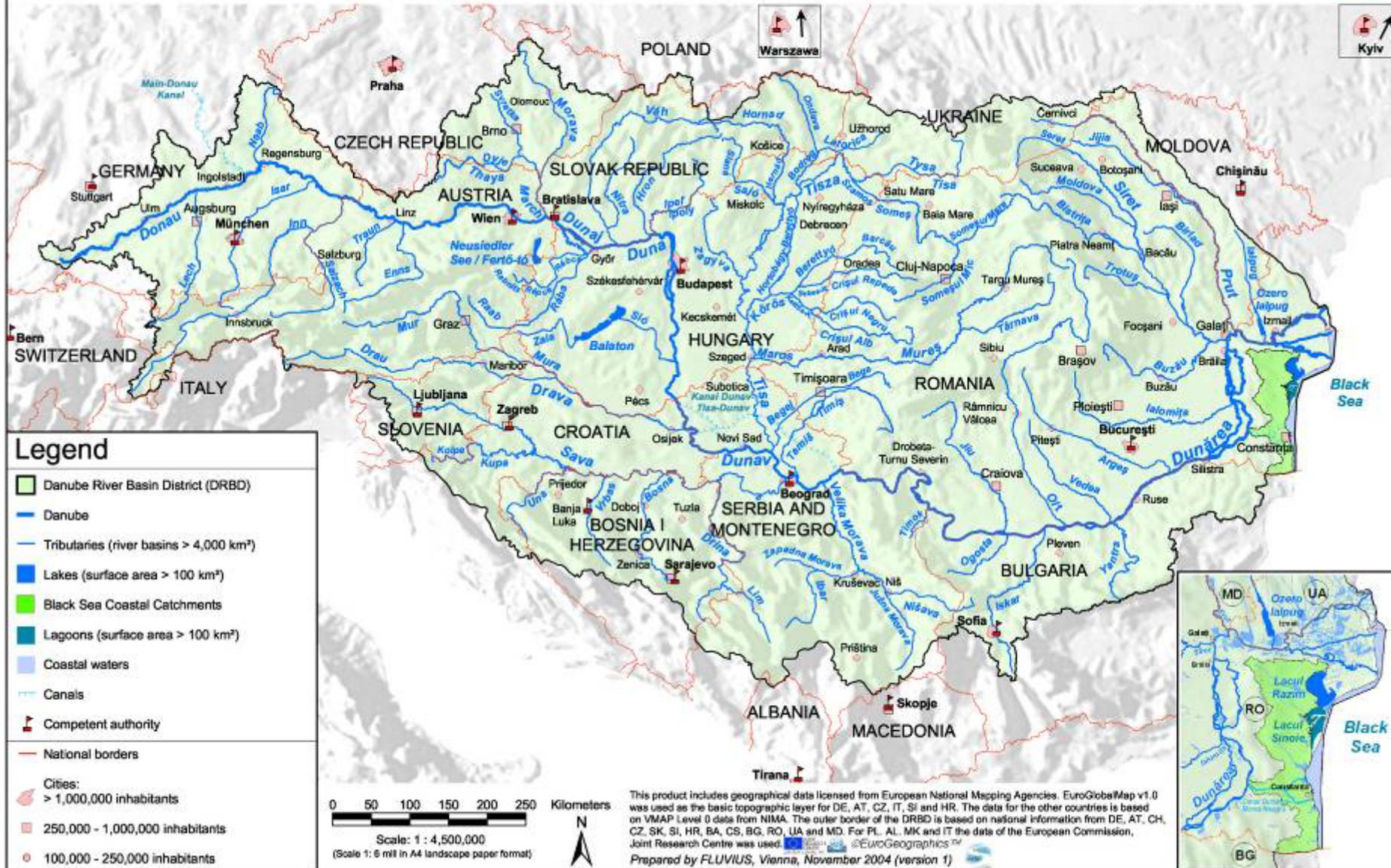
- ⇒ Characterisation of **surface waters**
  - ⇒ Natural characteristics (typology, reference conditions)
  - ⇒ Pressure/impact analysis
  - ⇒ Preliminary designation HMWBs
- ⇒ Characterisation of **groundwaters**
- ⇒ Inventories of **protected areas**

**Estimation of water bodies  
*at risk / possibly at risk  
of achieving WFD objectives***

# Danube River Basin District

## Map 1: Overview

Product of:  
ICPDR (International  
Commission for the  
Protection of the  
Danube River), Vienna



### Legend

- Danube River Basin District (DRBD)
- Danube
- Tributaries (river basins > 4,000 km<sup>2</sup>)
- Lakes (surface area > 100 km<sup>2</sup>)
- Black Sea Coastal Catchments
- Lagoons (surface area > 100 km<sup>2</sup>)
- Coastal waters
- Canals
- Competent authority
- National borders
- Cities:
  - > 1,000,000 inhabitants
  - 250,000 - 1,000,000 inhabitants
  - 100,000 - 250,000 inhabitants

0 50 100 150 200 250 Kilometers  
Scale: 1 : 4,500,000  
(Scale 1: 6 mill in A4 landscape paper format)

This product includes geographical data licensed from European National Mapping Agencies. EuroGlobeMap v1.0 was used as the basic topographic layer for DE, AT, CZ, IT, SI and HR. The data for the other countries is based on VMAP Level 0 data from NIMA. The outer border of the DRBD is based on national information from DE, AT, CH, CZ, SK, SI, HR, BA, CS, BG, RO, UA and MD. For PL, AL, MK and IT the data of the European Commission, Joint Research Centre was used. ©EuroGeographics™  
Prepared by FLUVIUS, Vienna, November 2004 (version 1)



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# Joint action.....

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....to achieve comparable results throughout  
the basin

in agreement with Danube countries  
as basis for future RBM steps (JPM)

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# Danube Basin Analysis

## Basic Approach

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# Pressure/Impact Assessment



## Basics

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**PRESSURE**

**IMPACT/RISK**

**CRITERIA**

**CRITERIA**

Identification  
**Significant Pressures**

Identification  
**Significant impacts**

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# Anthropogenic pressures

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## Point source pollution

- ⇒ Organic substances
- ⇒ Nutrients
- ⇒ Hazardous substances

## Diffuse source pollution

- ⇒ Nutrients
- ⇒ Hazardous substances

## Hydromorphological alterations

- ⇒ Continuity interruptions
- ⇒ Lateral disconnection
- ⇒ Water abstraction



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# Danube Basin Analysis

## Key Results



# Significant Water Management Issues



Organic  
Pollution



Nutrient  
Pollution

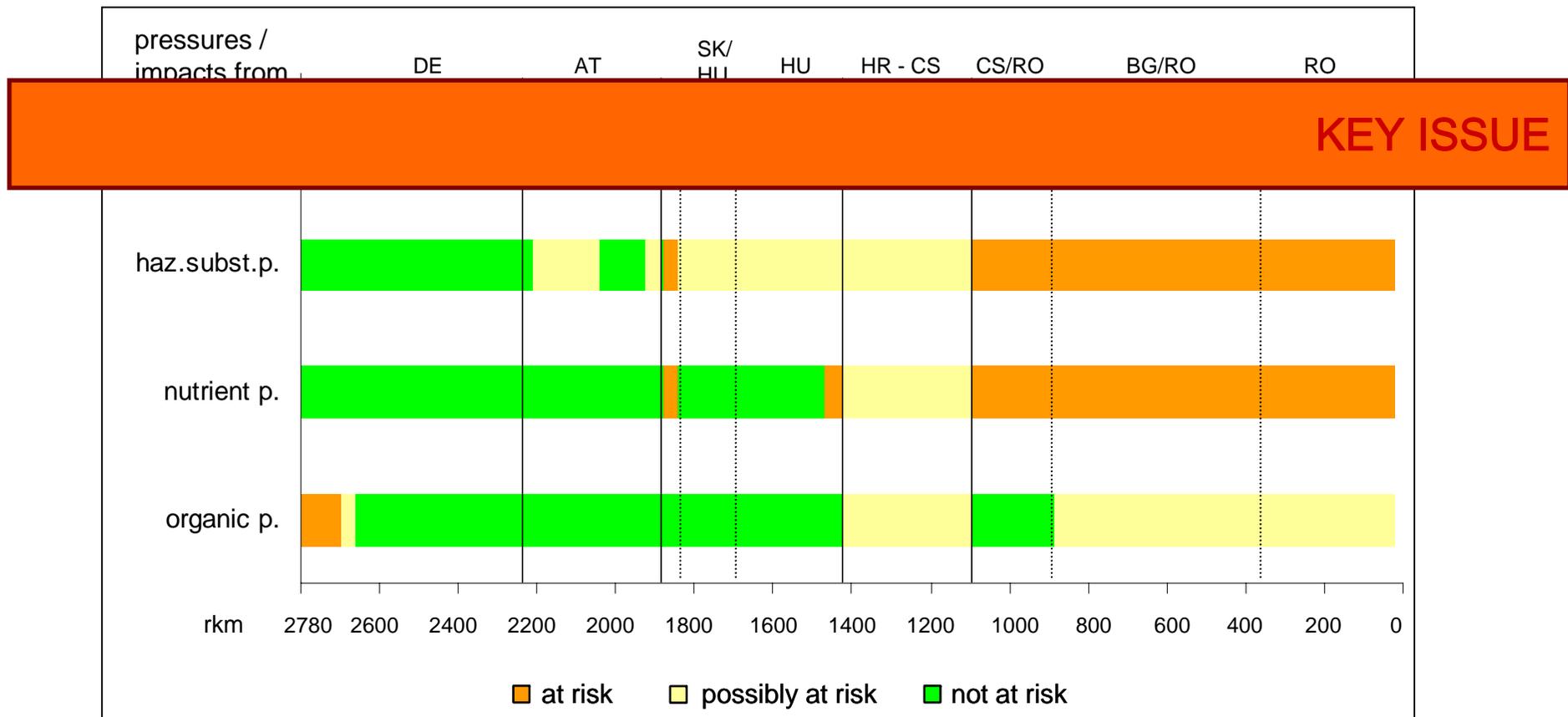


Hazardous  
Substances Pollution



Hydromorphological  
Alterations

# Identification Significant Water Management Issues



Hydromorphological alterations (HMA) are one of the key issues in the Danube River Basin

# Results Pollution

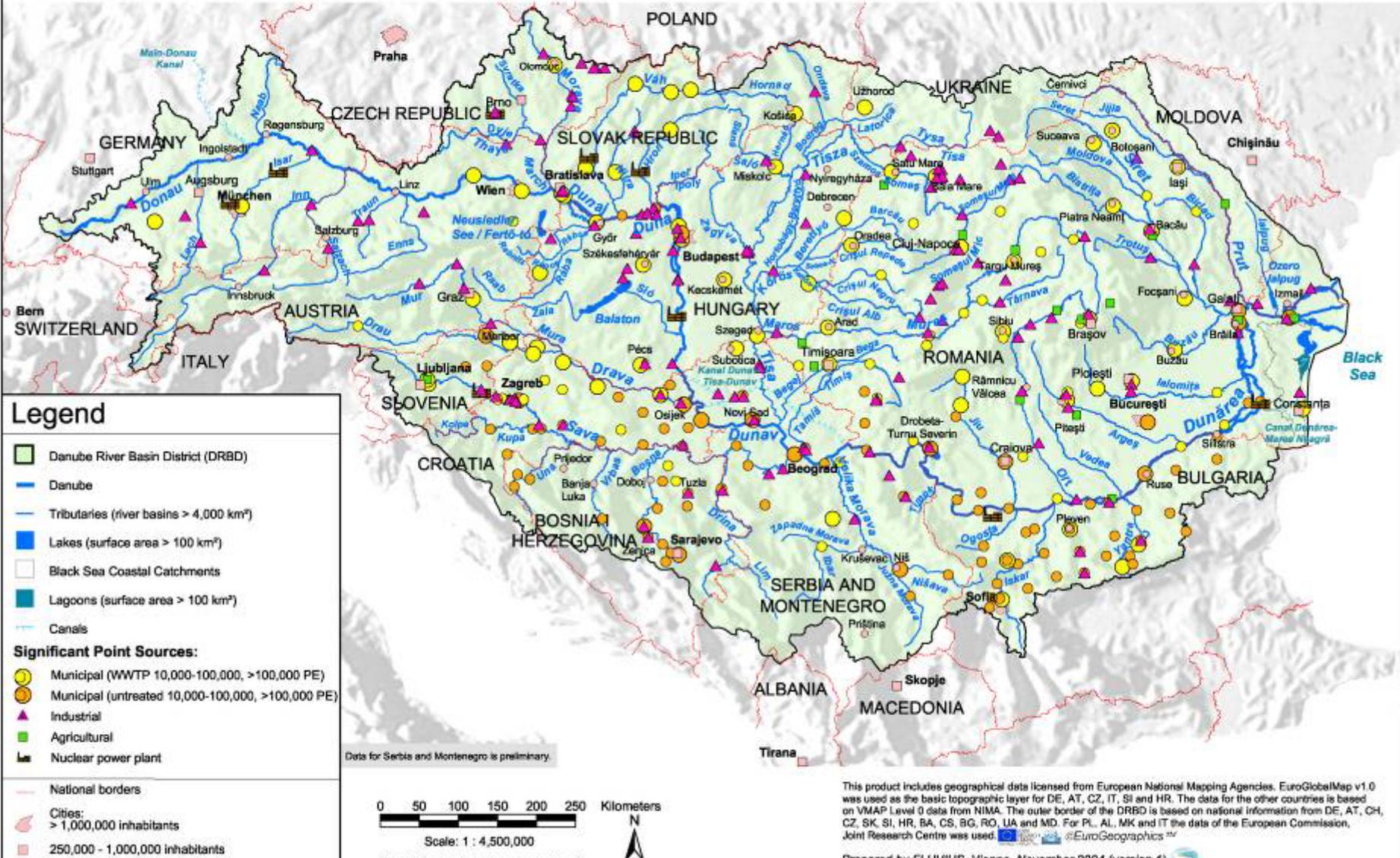


# Point sources of pollution

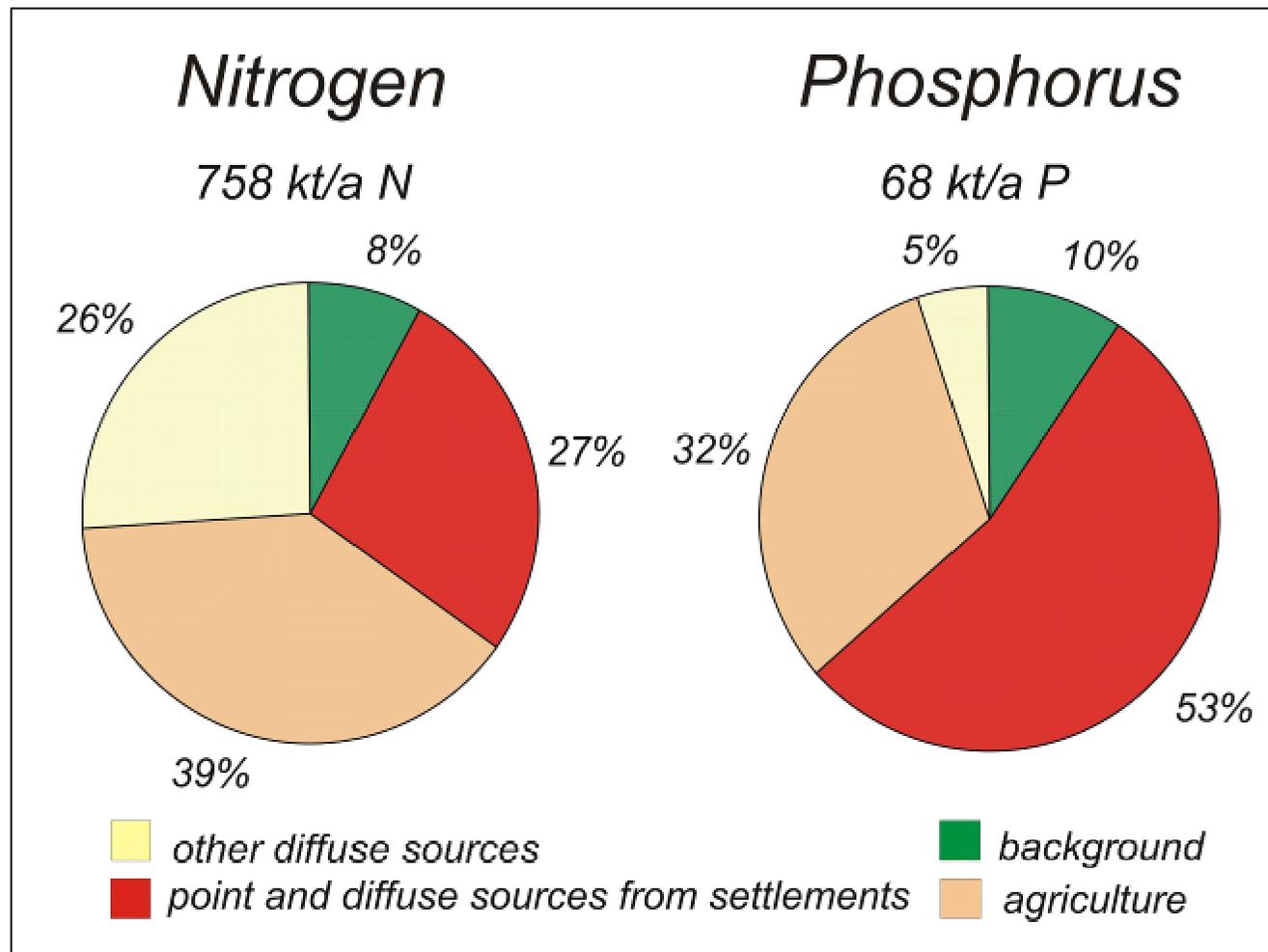
**Danube River Basin District**  
**Map 5: Significant Point Sources of Pollution**

Product of:  
 ICPRD (International  
 Commission for the  
 Protection of the  
 Danube River), Vienna

**icpdr ikisd**  
 International Commission  
 for the Protection of the  
 Danube River



# Diffuse sources of pollution



# Risk of Failure....

**icpdr iksd**

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



e DRB  
t Vogel

# Results

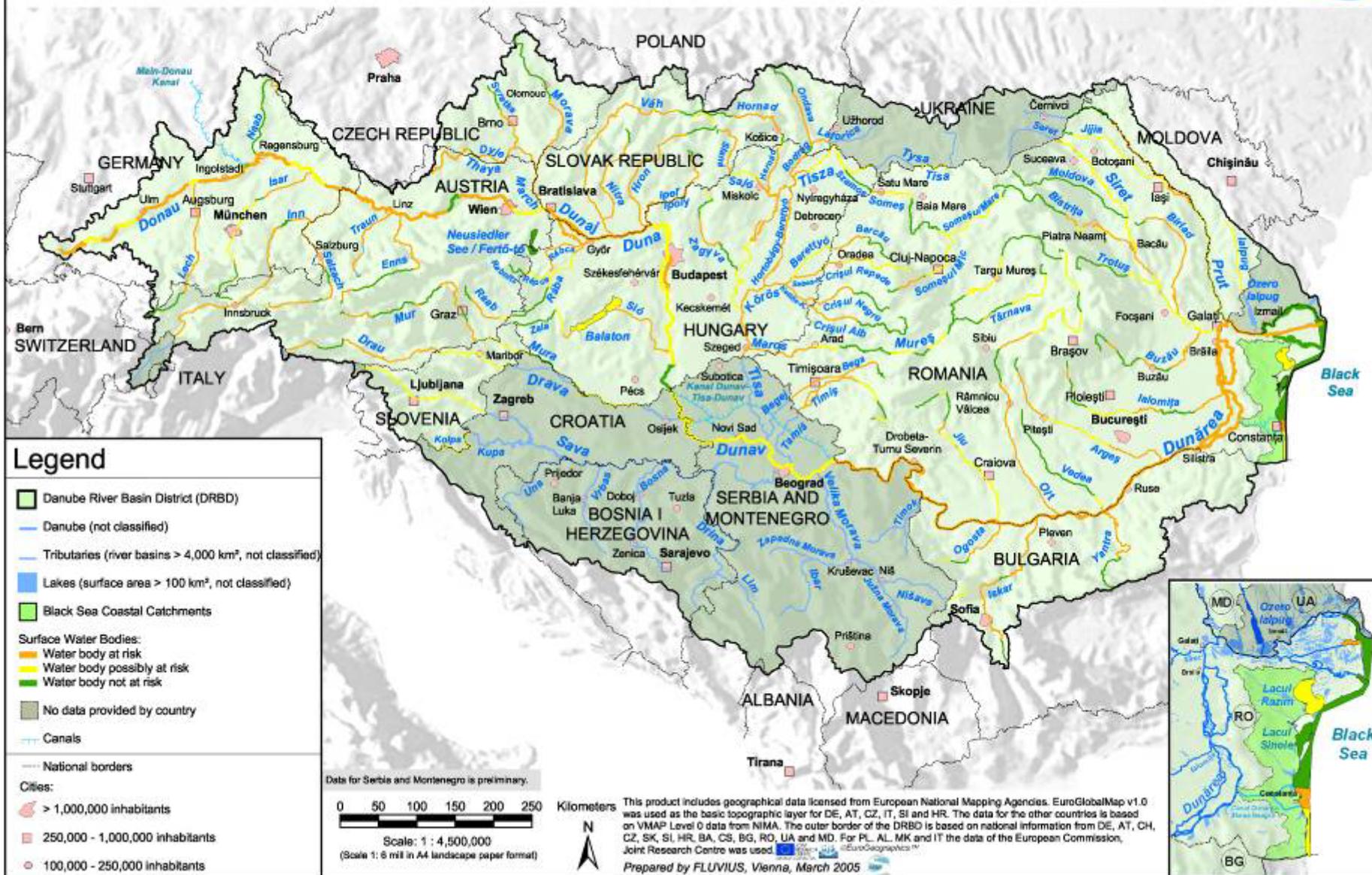
## Hydromorphological

## Alterations



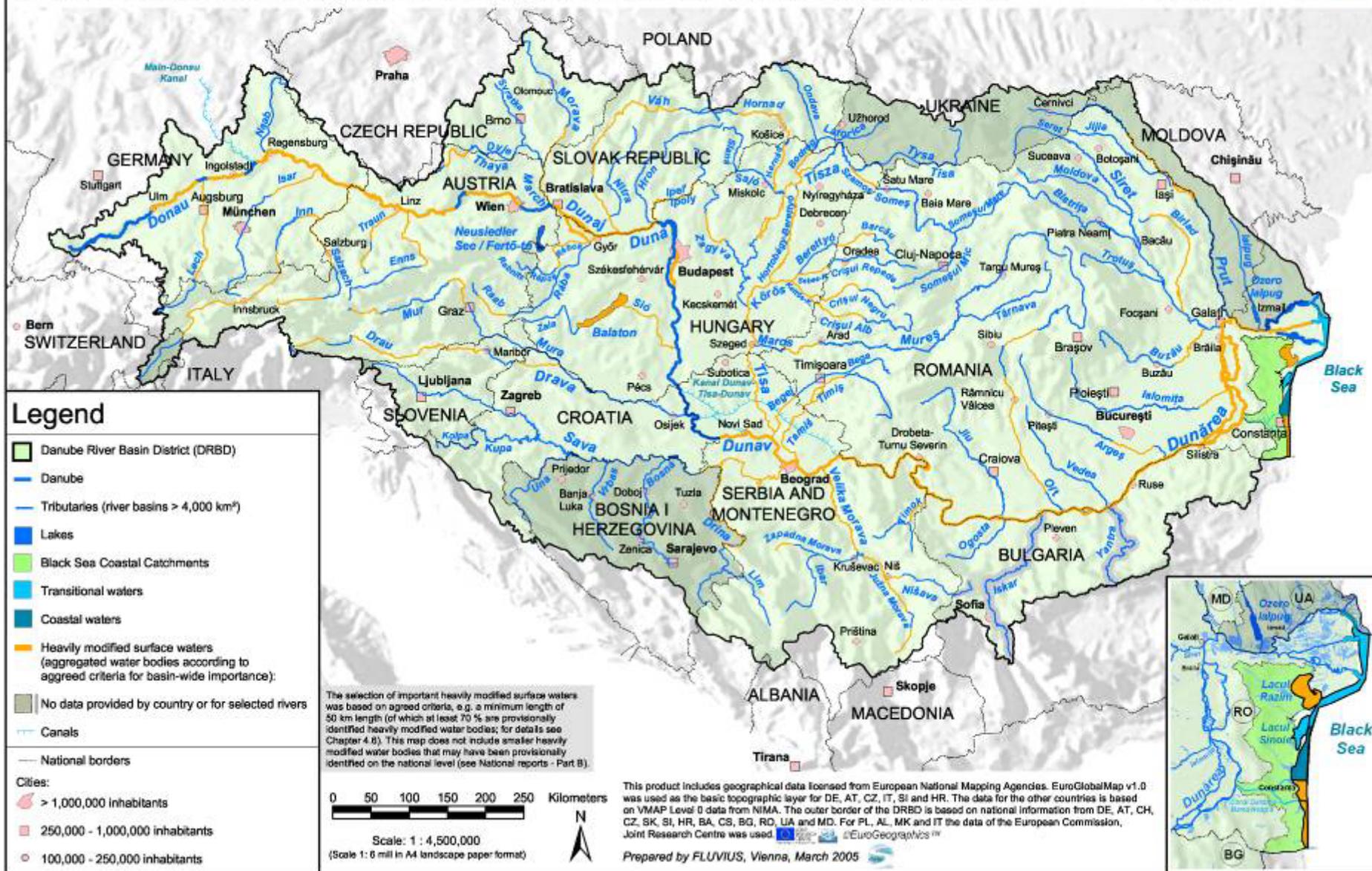
# Danube River Basin District

## Map 14: Risk of failure to reach the Environmental Objectives - Hydromorphological Alterations



# Danube River Basin District

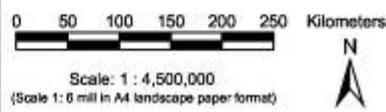
## Map 10: Important Heavily Modified Surface Waters (provisional identification)



### Legend

- Danube River Basin District (DRBD)
- Danube
- Tributaries (river basins > 4,000 km<sup>2</sup>)
- Lakes
- Black Sea Coastal Catchments
- Transitional waters
- Coastal waters
- Heavily modified surface waters (aggregated water bodies according to agreed criteria for basin-wide importance):
- No data provided by country or for selected rivers
- Canals
- National borders
- Cities:
- > 1,000,000 inhabitants
- 250,000 - 1,000,000 inhabitants
- 100,000 - 250,000 inhabitants

The selection of important heavily modified surface waters was based on agreed criteria, e.g. a minimum length of 50 km length (of which at least 70 % are provisionally identified heavily modified water bodies; for details see Chapter 4.8). This map does not include smaller heavily modified water bodies that may have been provisionally identified on the national level (see National reports - Part B).



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Prepared by FLUVIUS, Vienna, March 2005



# Hydromorphological Alterations

## Drivers

### Key Drivers

Hydropower generation

Flood defence

### Navigation



### Other Drivers

Water abstraction

Gravel abstraction

Recreational activities

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# Hydromorphological Alterations

## Pressures

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### Morphological Alterations

- ⇒ Interruption of longitudinal continuum
- ⇒ Interruption of lateral connectivity of rivers

### Hydrological Alterations

### Other hydromorphological alterations



# Which Driver - Which Pressures?

DRIVER	Hydropower Generation	Flood Defence	Navigation
POSSIBLE PRESSURES	alteration of sediment transport	floodplain reduction	bed stabilisation dredging
<b><i>Overlapping Pressures</i></b>			
<b>Interruption longitudinal continuity</b> <b>Disruption of lateral connectivity</b> <b>Bank reinforcement</b> <b>Alteration of river course and channelform/profile</b> <b>Alteration of hydraulic/hydrological characteristics</b>			

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# PRESSURE FACTS in DRB



## Navigation

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- ⇒ Pressure relevant in Danube River itself and lower tributaries
- ⇒ Upper Danube: construction of lateral dams since end of 19<sup>th</sup> century
- ⇒ Hungary: Danube course was shortened (cut off meanders) from 472 km to 417 km
- ⇒ 78 harbours between Kehlheim and Black Sea
- ⇒ Dredged canals in Danube Delta since beginning of 20<sup>th</sup> century.  
1700 km of channels.



# Main Impacts in the DRB



decline of  
species  
diversity

decline of  
species  
abundance

Habitat loss  
and alteration

hindrance of species  
migration & decline  
of natural  
reproducing fish  
populations

altered  
population  
composition

**ECOLOGICAL STATUS DEGRADATION**

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# Future Steps



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# INTEGRATED DRBM PLAN 2009

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- ⇒ Achievement of environmental objective by 2015:  
good ecological/chemical status
- ⇒ **Holistic approach**
  - ⇒ Consider all functions, uses, pressures/impacts and future infrastructure projects
- ⇒ Development of **Joint Programme of Measures (JPM)**
  - ⇒ largely based on national measures
  - ⇒ measures on supra-national level
- ⇒ **Long-term visions**

# DRBM PLAN

## Steps



### .....towards the final Danube RBM Plan

- ⇒ Issue Papers for all Significant Water Management Issues
  - ⇒ Hydromorphological Alterations
- ⇒ Document on SWMI
  - ⇒ First outline of DRBM Plan/Joint Programme of Measures (JPM)
  - ⇒ Publication end 2007
- ⇒ Inclusion into DRBM Plan/JPM for implementation
- ⇒ ICPDR Task Group on Hydromorphology

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# Visions & Management Objectives

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## for Hydromorphological Alterations Future Infrastructure Projects

.....addresses and includes pressures/impacts resulting  
from navigation

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# HYMO Alterations, Navigation & DRBM Plan

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Development of navigation  
in line with EU WFD

Joint Programme of Measures addresses

- ⇒ current **and** future pressures from navigation
- ⇒ measure implementation to achieve good ecological status
- ⇒ jointly find approach to reach that objective

**What is the vision towards an environmentally friendly  
Navigation in the DRB?**

# THANK YOU FOR YOUR ATTENTION!

*birgit.vogel@unvienna.org*

