

# **Danube Basin Analysis (WFD Roof Report 2004)**

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# Danube Basin Analysis Report

responds to reporting requirements under WFD

Art. 5, Annex II and III WFD

- river basin characteristics
- impacts of human activities
- economic analysis of water uses

Art. 6 and Annex IV WFD

- inventory for protected areas

 Reporting deadline: 22 March 2005

# Coordination requirements of the WFD

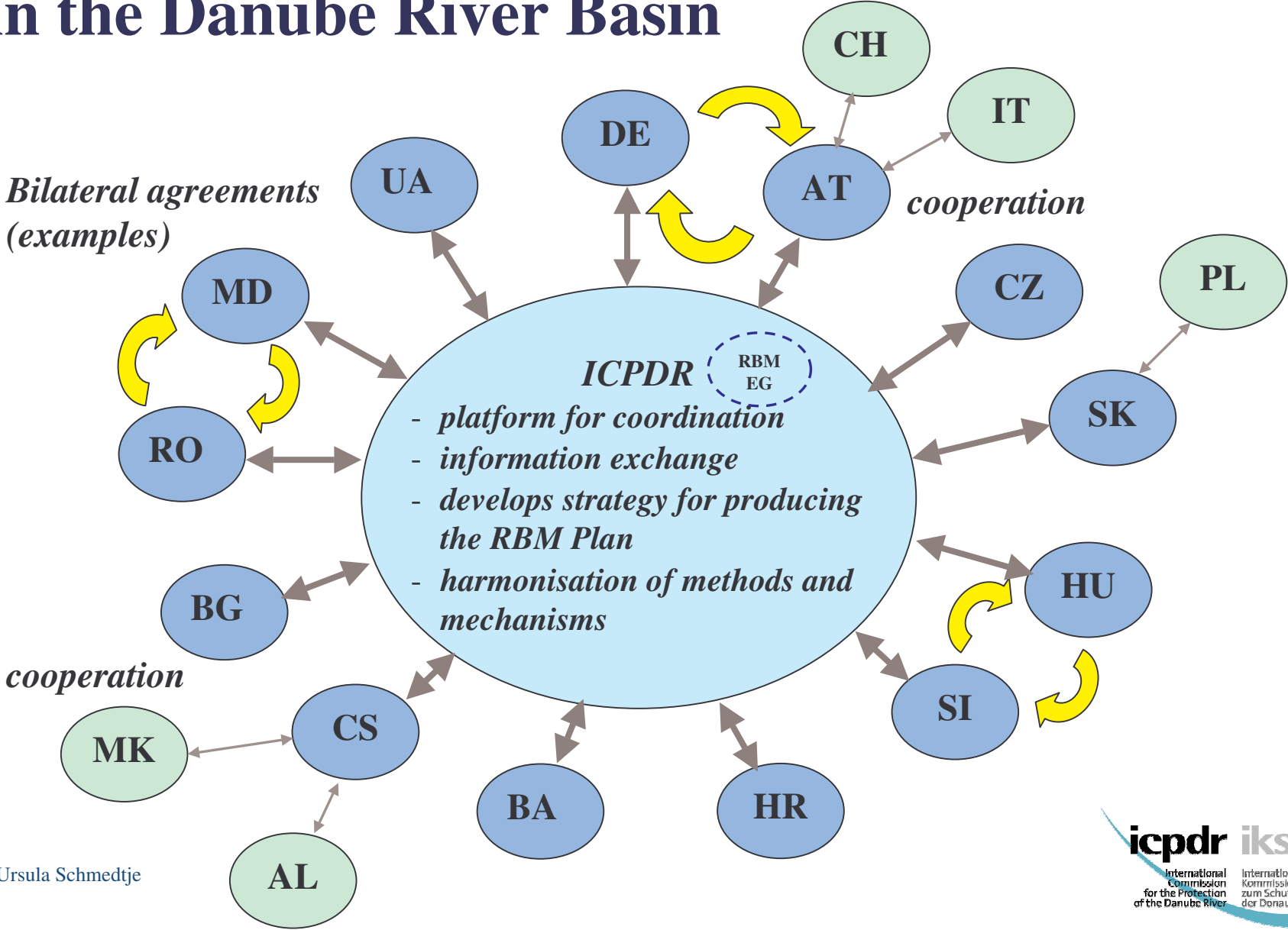
Where a river basin district extends beyond the territory of the Community:

“the Member States concerned **shall endeavour to establish appropriate coordination** with the relevant non-Member States, with the aim of achieving the objectives of this Directive throughout the river basin district.” (Art. 3.5)

For coordination of the river basin management plan:

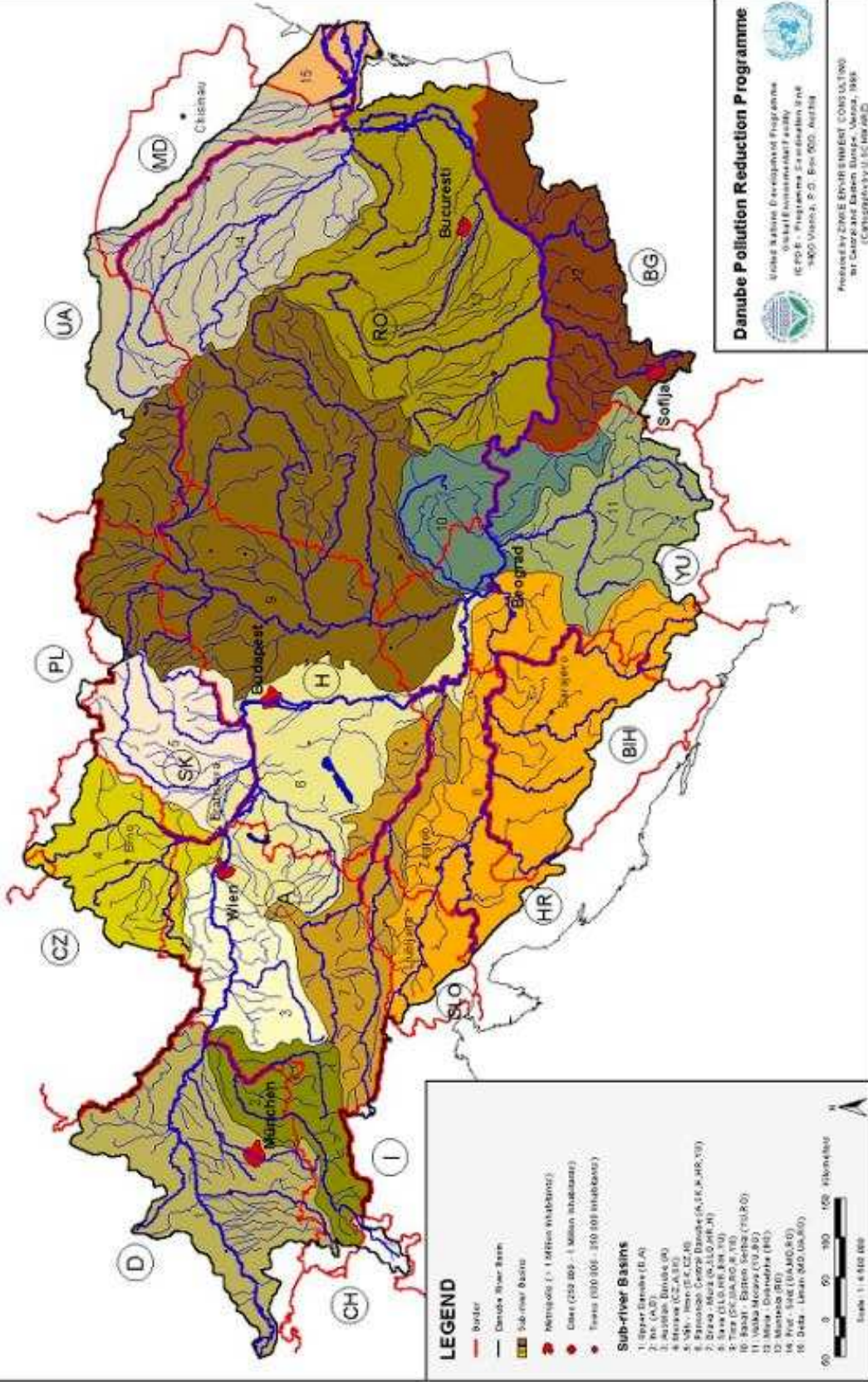
“The Member States **shall endeavour to produce a single river basin management plan**, and, where this is not possible, the plan shall at least cover the portion of the international river basin district lying within the territory of the Member State concerned.” (Art. 13.3)

# International coordination in the Danube River Basin



# Map 2: Sub-river Basins

Based on Transboundary Analysis Workshop 1999



**LEGEND**

- Border
- Danube River Basin
- Sub-river Basins
- Metropolis (> 1 Million inhabitants)
- Cities (250 000 - 1 Million inhabitants)
- Towns (50 000 - 250 000 inhabitants)

**Sub-river Basins**

1. Upper Danube (E, A)
2. In. (A, D)
3. Upper Tisza (H, U)
4. Middle Tisza (H, U)
5. In. - Danube (E, C, Z, H)
6. Pannonic Great Danube (A, S, K, H, R, Y)
7. Sava - Mur - Drava (H, R, A)
8. Save (S, L, O, R, E, H, U)
9. Tisza (S, C, R, B, A, G, R, U)
10. Middle Danube (E, H, U)
11. Middle Danube (H, U)
12. Middle Danube (H, U)
13. Middle Danube (H, U)
14. Prut - Siret (U, A, M, D, R)
15. Dniester - Lemn (M, D, U, A, R)
16. Dniester - Lemn (M, D, U, A, R)

0 50 100 150 Kilometers  
Scale 1:4 500 000

**Danube Pollution Reduction Programme**

United Nations Development Programme  
Global Environment Facility  
ICPDR - Programme d'Action de la  
"400 Villes, S.C. - E.P. 000, Austria

Prepared by ZWISER ENVIRONMENT CONSULTING  
for Central and Eastern Europe, Vienna, 1999  
(Cartography by U. Schmalz)

# Levels of coordination

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Level	Amount of coordination
• Danube river basin level	limit to the absolutely necessary <i>(issues affecting the whole DRBD)</i>
• Bilateral/multilateral level	a lot <i>(in case of transboundary effects)</i>
• National level	a lot <i>(for all issues regarding implementation)</i>

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# Structure of the report

Part A – Basin-wide overview (WFD Roof report)

Part B – Detailed national reports

Part A: Roof of the Danube River Basin District Management Plan													
Part B: National plans	GERMANY	AUSTRIA	CZECH REPUBLIC	SLOVAK REPUBLIC	HUNGARY	SLOVENIA	CROATIA	BOSNIA I HERZEGOVINA	SERBIA AND MONTENEGRO	BULGARIA	ROMANIA	MOLDOVA	UKRAINE



EU-Member States



EU-Accession countries



Other countries

# Part A: Basin-wide overview

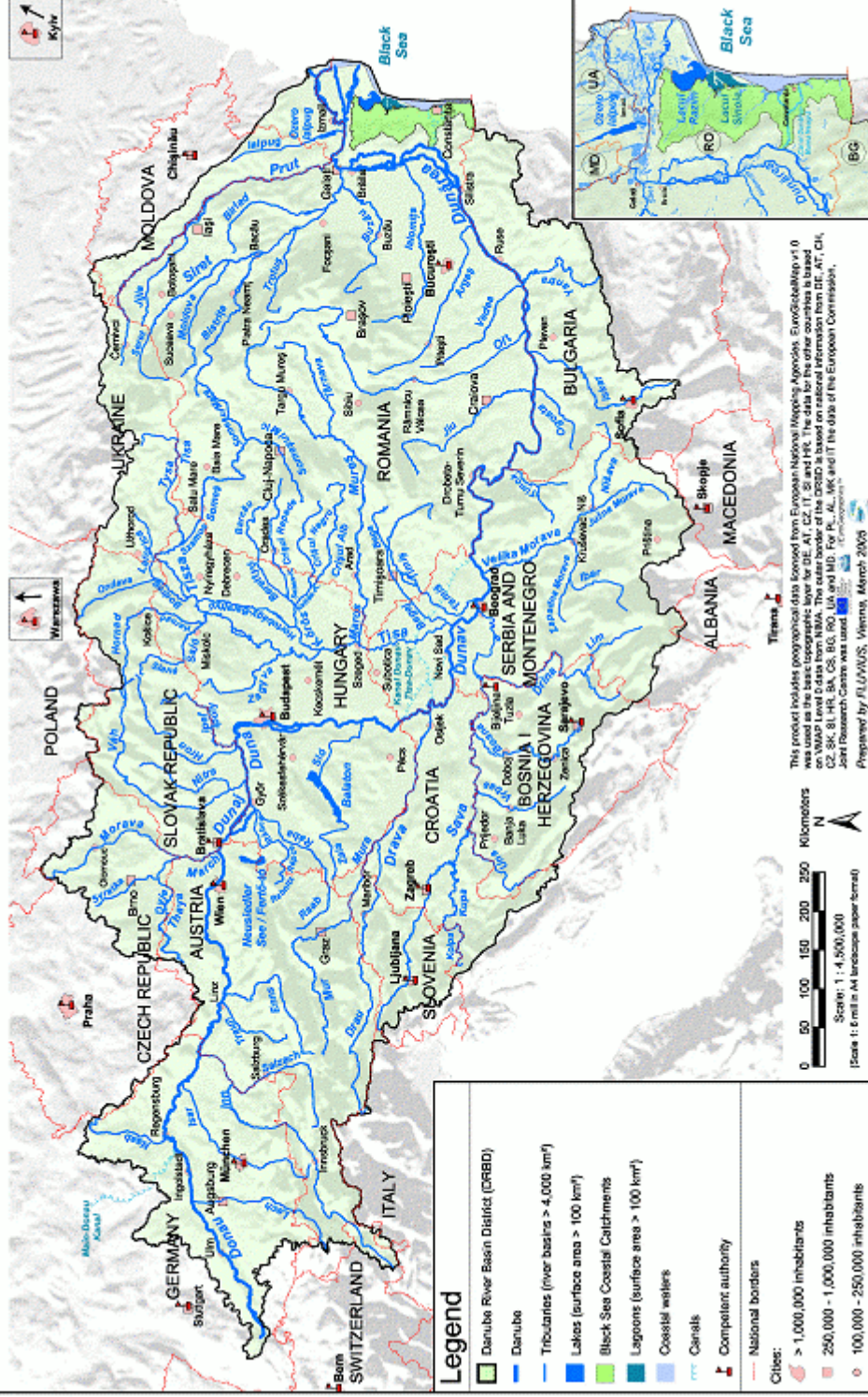
## The Roof report deals with

- all rivers with catchments of  $> 4000 \text{ km}^2$
- all lakes with an area of  $> 100 \text{ km}^2$
- transitional and coastal waters (overview)
- the main navigation canals
- all transboundary groundwater bodies with an area of  $> 4000 \text{ km}^2$

# Danube River Basin District

## Map 1: Overview

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



This product includes geographical data sourced from European National Mapping Agencies. EuroGlobalMap v1.0 was used as the base geographic base for DE, AT, CZ, IT, SI and SK. The data for the other countries is based on WMAP 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.

Prepared by ALUMAVIS, Vienna, March 2009

### 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 wetlands
  - Canals
  - Competent authority
  - National borders
- Cities:**
- > 1,000,000 inhabitants
  - 250,000 - 1,000,000 inhabitants
  - 100,000 - 250,000 inhabitants

# Contents of the report

- The Danube River Basin District and its international coordination arrangements
- Characterisation of surface waters
- Characterisation of groundwaters
- Inventories of protected areas
- Economic analysis
- Public information and consultation
- Key conclusions and outlook

# Key objective: to achieve comparable results throughout the basin

## Information used:

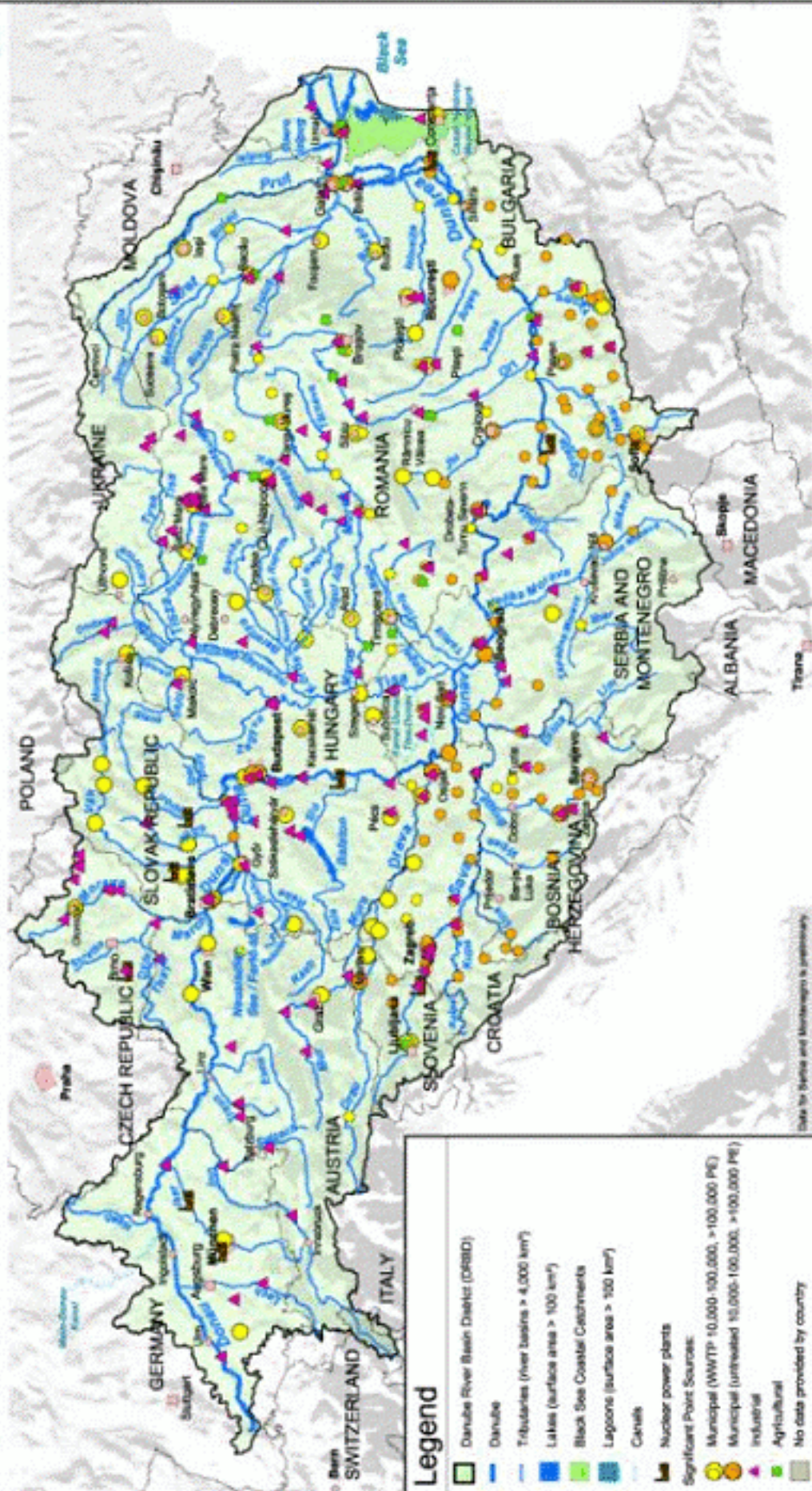
- data and information officially delivered by the competent authorities of the Danube countries for the purpose of this report based on agreed criteria,
- published data from basin-wide studies, or
- modelled data (in particular for nutrient emissions) where comparable data was not available

 in agreement with the Danube countries

# Danube River Basin District

## Map 5: Significant Point Sources of Pollution

Product of  
**icpdr** IKSOL  
 International Commission for the Protection of the Danube River, Vienna



**Legend**

- Danube River Basin Districts (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>)
- Canals
- Nuclear power plants

**Significant Point Sources:**

- Municipal (WWTP >10,000-100,000, >100,000 PE)
- Municipal (untreated >10,000-100,000, >100,000 PE)
- Industrial
- Agricultural
- No data provided by country

**Other Symbols:**

- National borders
- Cities:
  - > 1,000,000 inhabitants
  - 250,000 - 1,000,000 inhabitants
  - 100,000 - 250,000 inhabitants

This product includes geographical data furnished from European National Mapping Agencies, EuroCityMap v1.9 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 2 data from NOAA. The color border of the DRBD is based on national information from DE, AT, CH, CZ, SK, SI, HR, BA, BG, RO, MD, UA and MD. For PL, AL, MK and IT the data of the European Commission Joint Research Centre was used. [www.eurocities.com](http://www.eurocities.com) - EuroGeographics

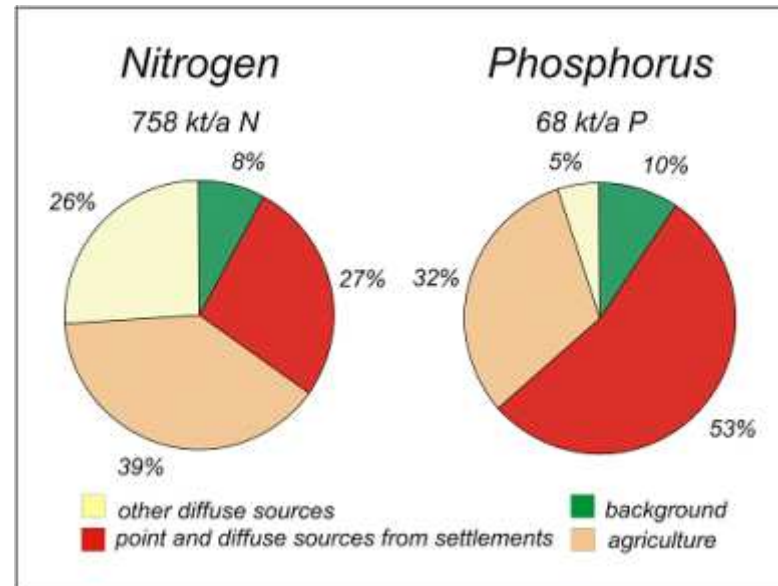
Prepared by FLUVIUS, Vienna, March 2008



Data for Serbia and Montenegro is preliminary

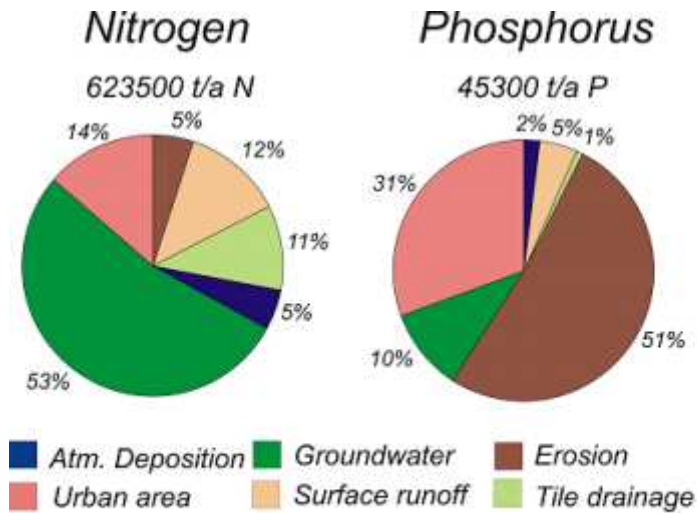
# Total nutrient pollution

Point and diffuse emissions based on modelling for 1998-2000

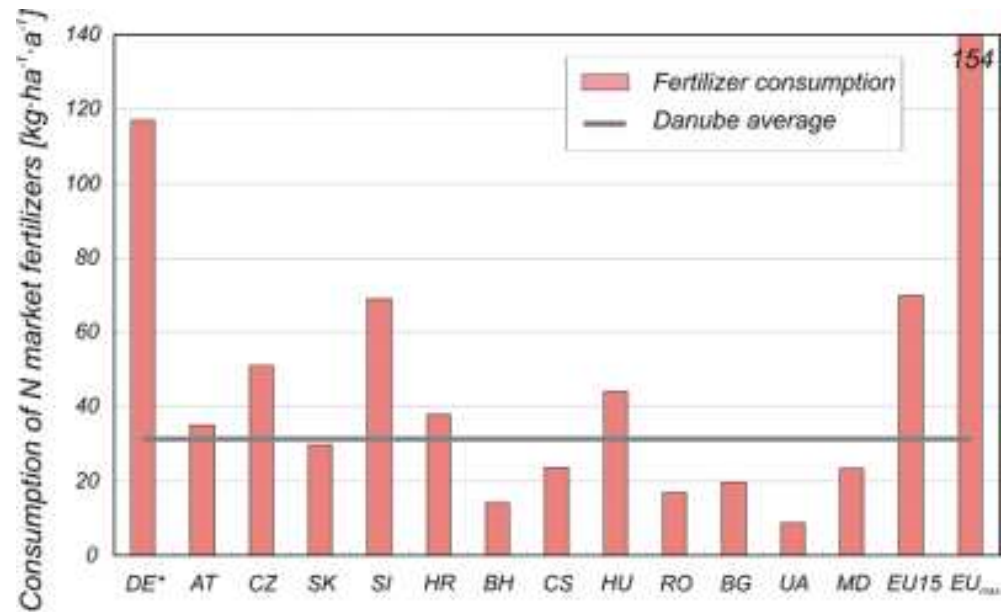


# Diffuse nutrient pollution

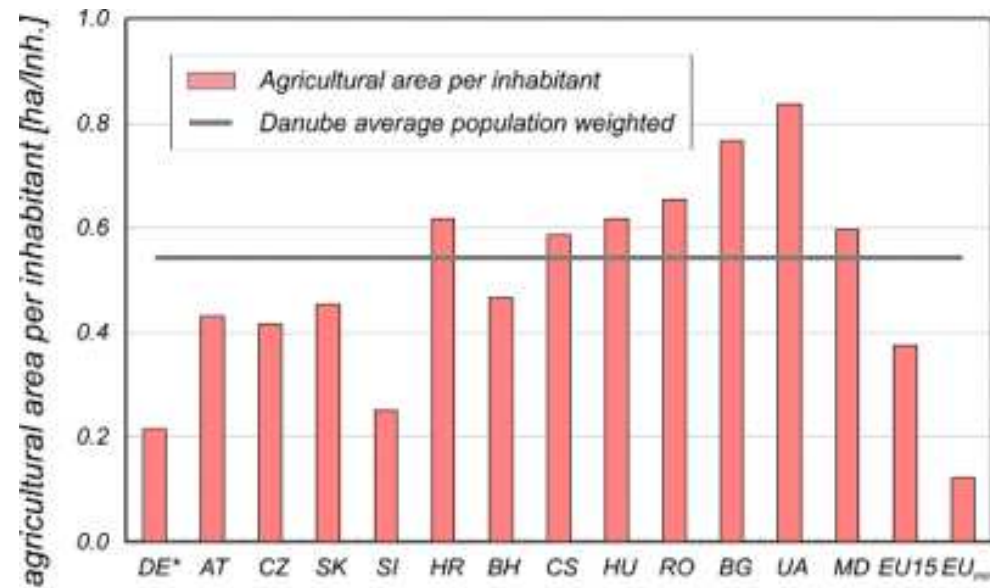
divided by pathways (based on modelling for 1998-2000)



# Nitrogen fertilizer consumption in the Danube River Basin

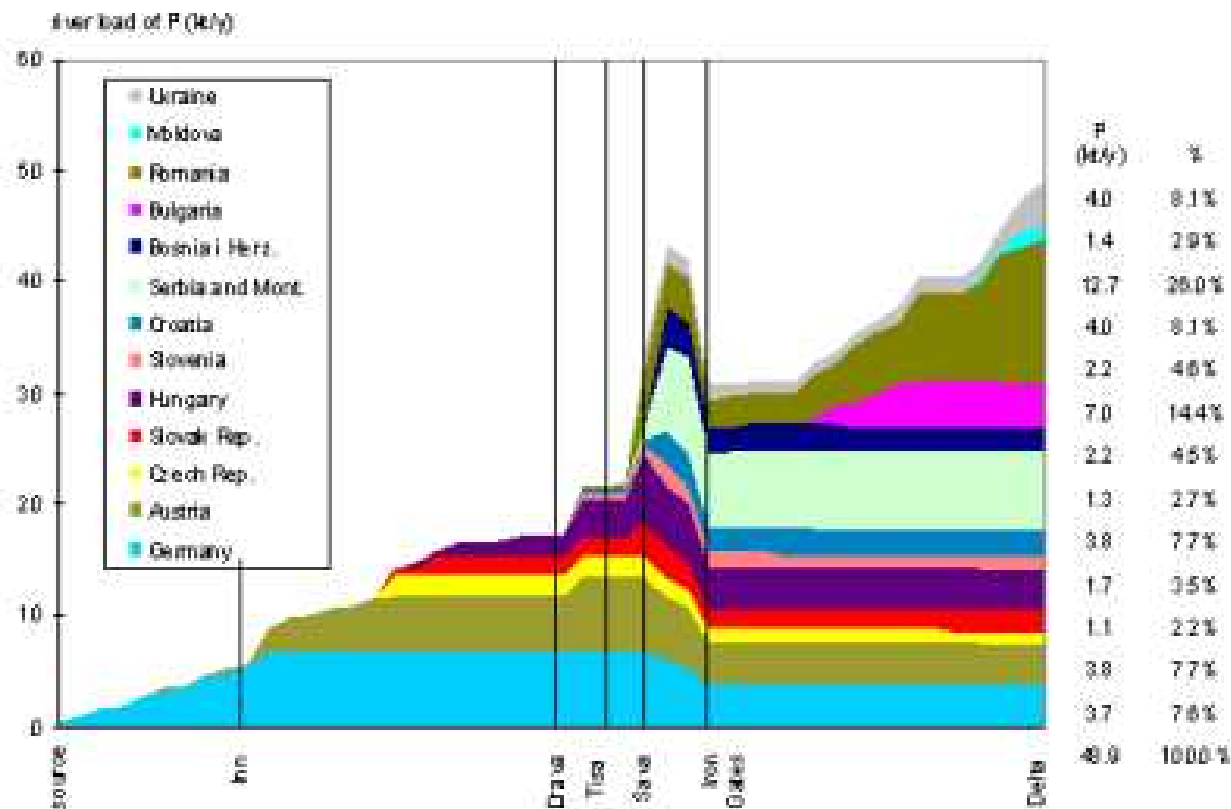


# Agricultural area per inhabitant based on modelling for 1998-2000



# Phosphorous load in the Danube [kt/a]

## based on the Danube Water Quality Model 1999



# Risk of failure to reach the environmental objectives with regard to nutrients



# Hazardous substances

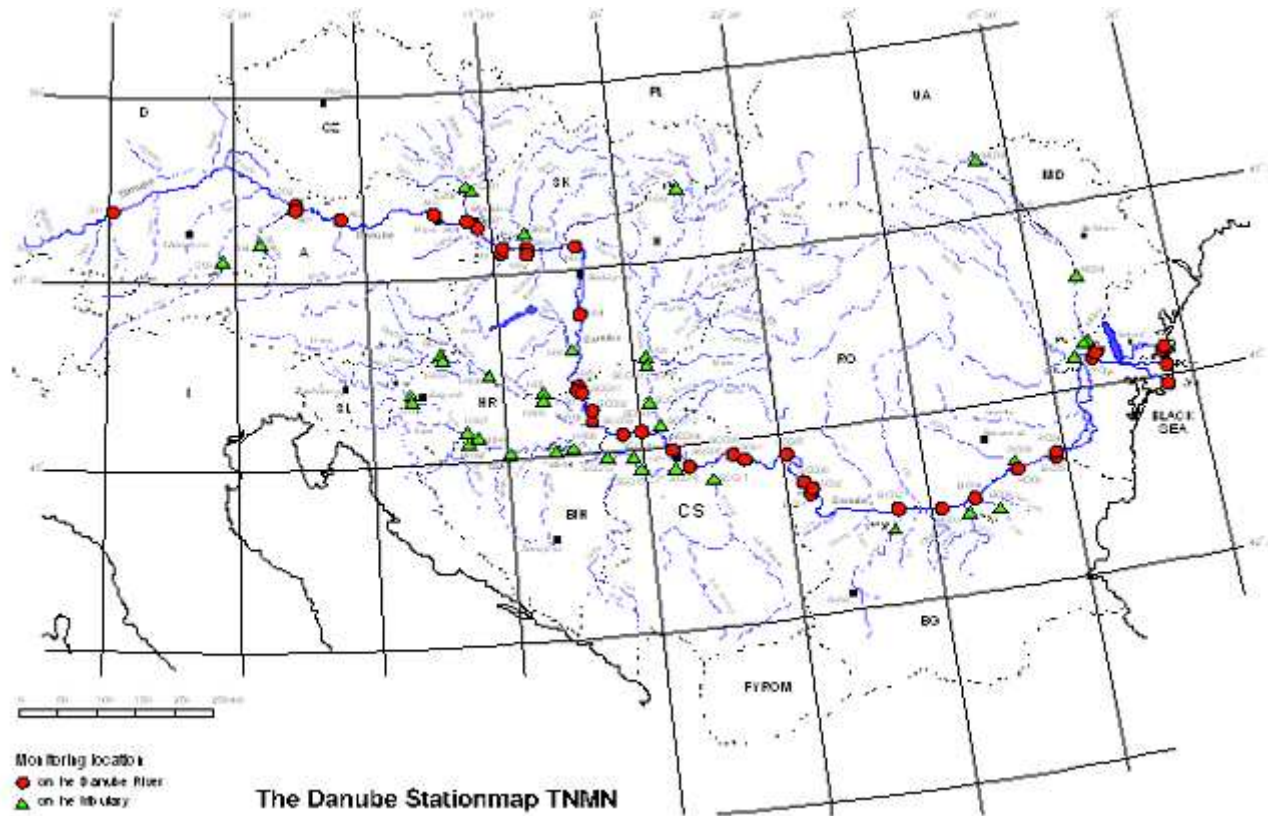
## Hazardous substances:

toxic, persistent and liable to bio-accumulate or which give rise to an “equivalent level of concern”

## Sources:

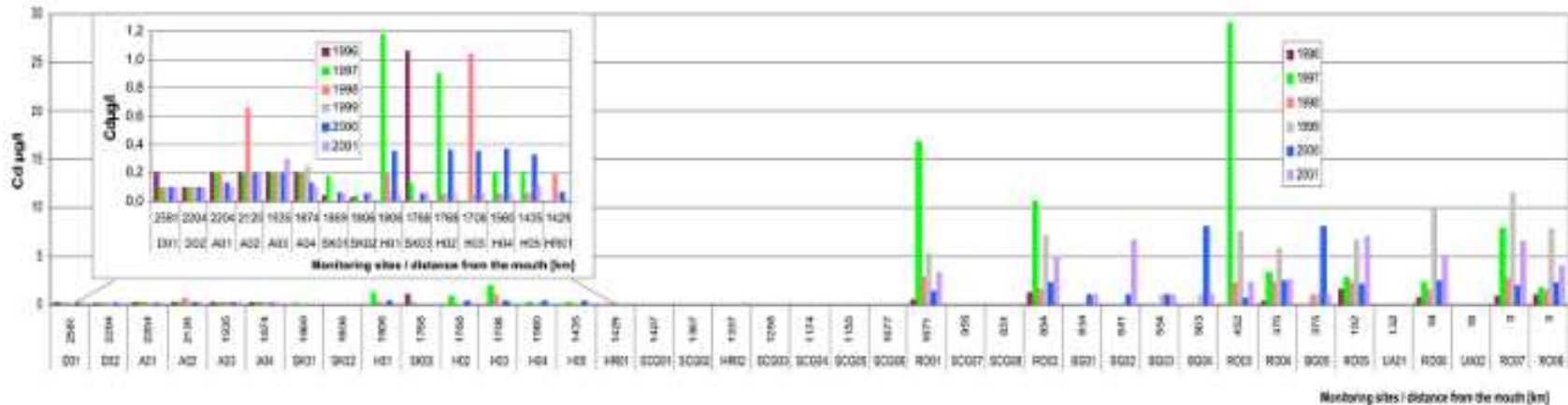
- Natural (e.g. background concentrations heavy metals)
- Anthropogenic (identified in emission inventories)
  - Agriculture
  - Industry
  - Municipalities

# Transnational Monitoring Network



# Cadmium

## Concentrations in the Danube River in 1996-2001

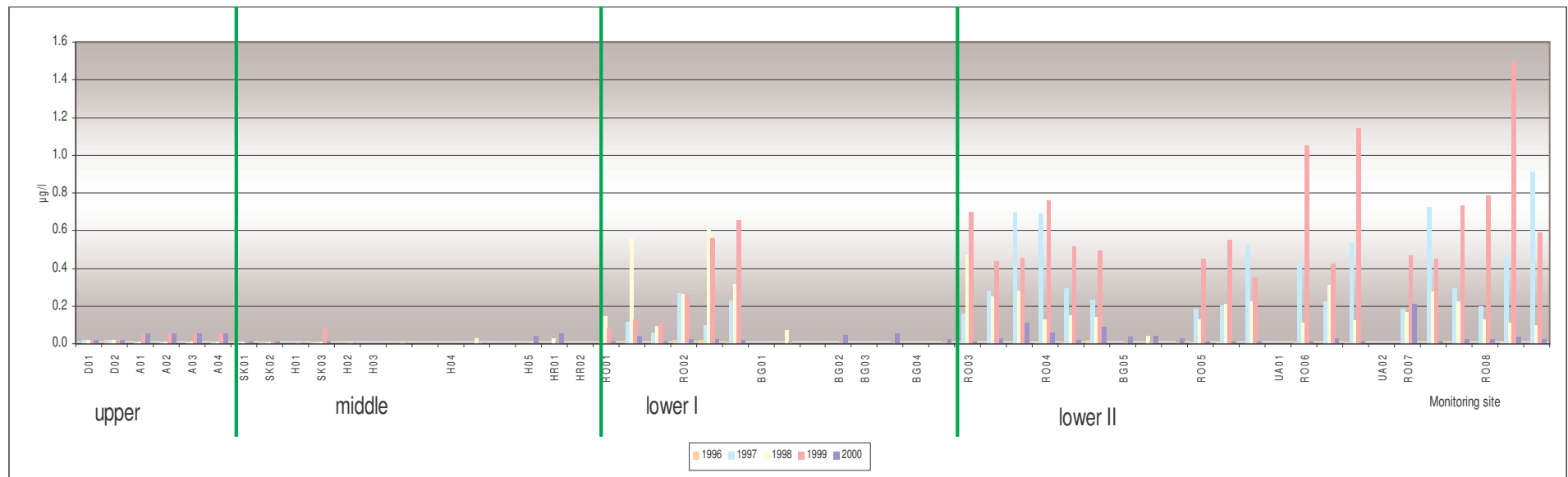


Danube source ..... mouth

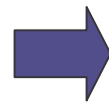
➔ similar situation for Lead

# pp'-DDT

## Concentrations in the Danube River in 1996-2000



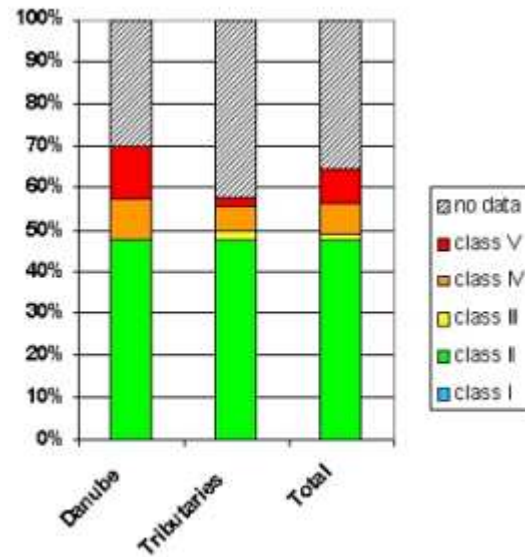
Danube source ..... mouth



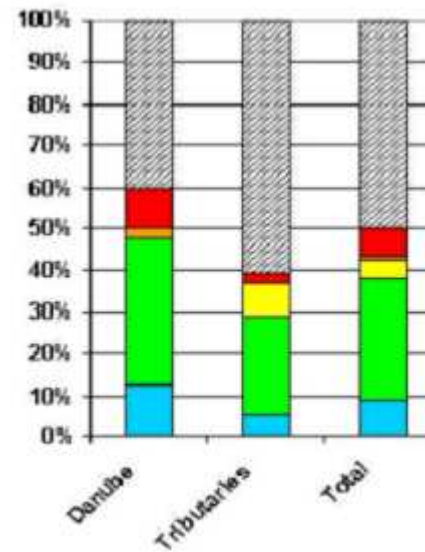
similar situation for Lindane

# TNMN Water Quality Classes for 2001

## Cadmium



## Atrazine



# Hydromorphological alterations

## Identification of

- significant water abstraction for urban, industrial, agricultural and other uses
- the impact of significant flow regulation, incl. water transfer and diversion on overall flow characteristics and water balances
- significant morphological alterations to water bodies

# Hydromorphological alterations

## Main driving forces

- Hydropower generation (mainly dams)
- Flood defense measures (river regulation works)
- Navigation and channel maintenance
- Future infrastructure projects

# Hydromorphological alterations

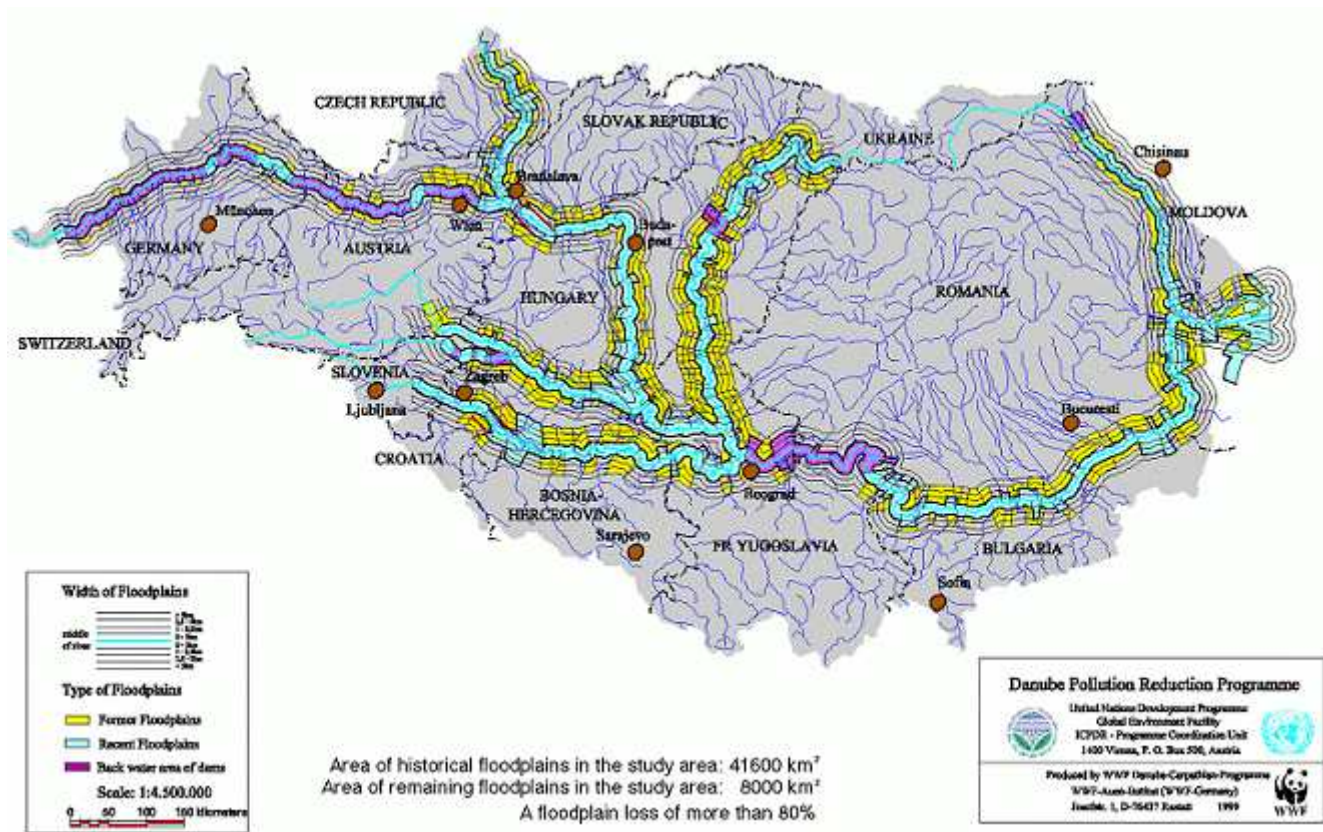
## Major pressures

- Disruption of longitudinal river continuity by artificial in-channel structures
- Alteration of hydraulic characteristics
- Alterations of river course and channel form
- Disruptions of lateral connection with flood plains
- Alteration of discharge regime

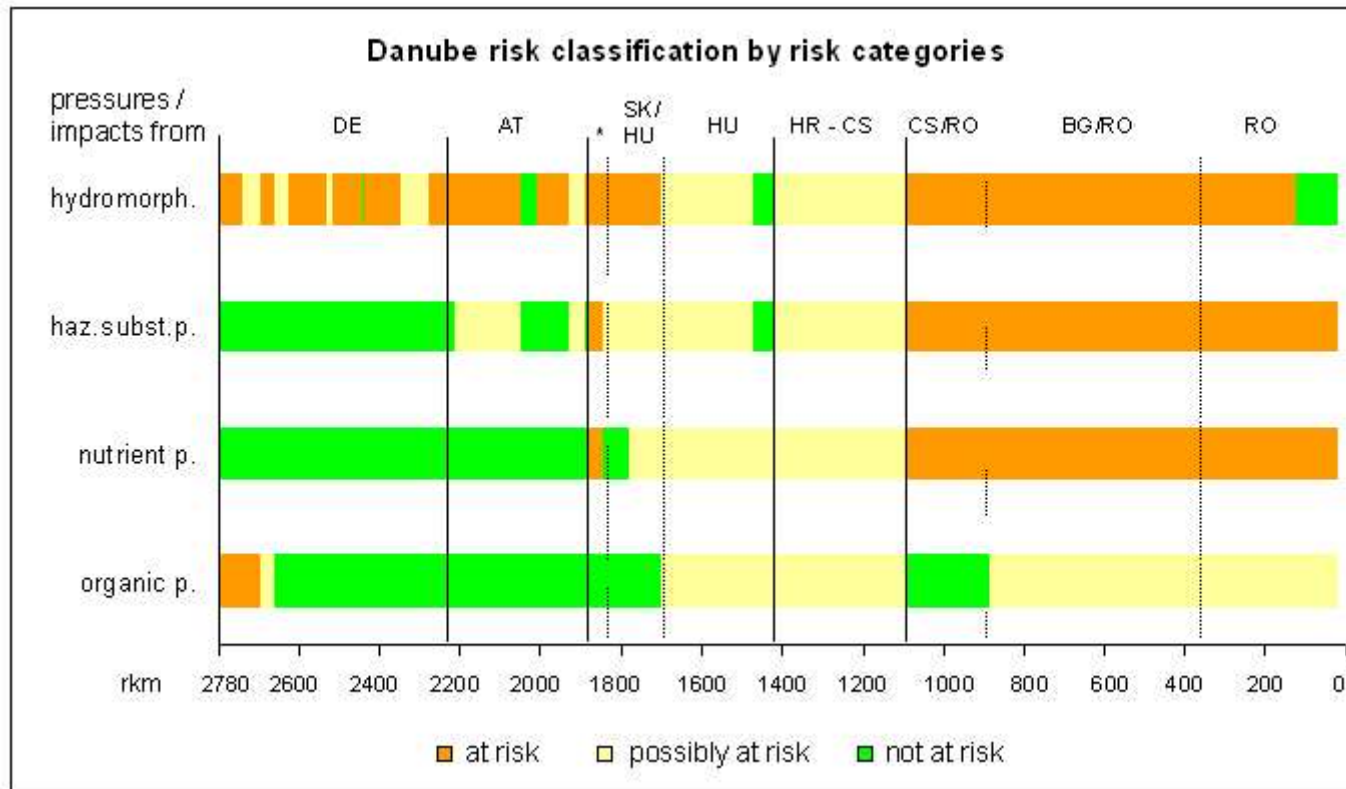
➔ Effects on fauna and flora, in particular fish

# Impacts from hydromorphological alterations

## Symbolised view of the loss of floodplains



# Risk of failure to reach the environmental objectives on the Danube





# Danube River Basin District Map 16: Important Water-related Protected Areas for Species and Habitat Protection

Project of  
Special Implementation  
Measure for the  
Danube River 1. Phase