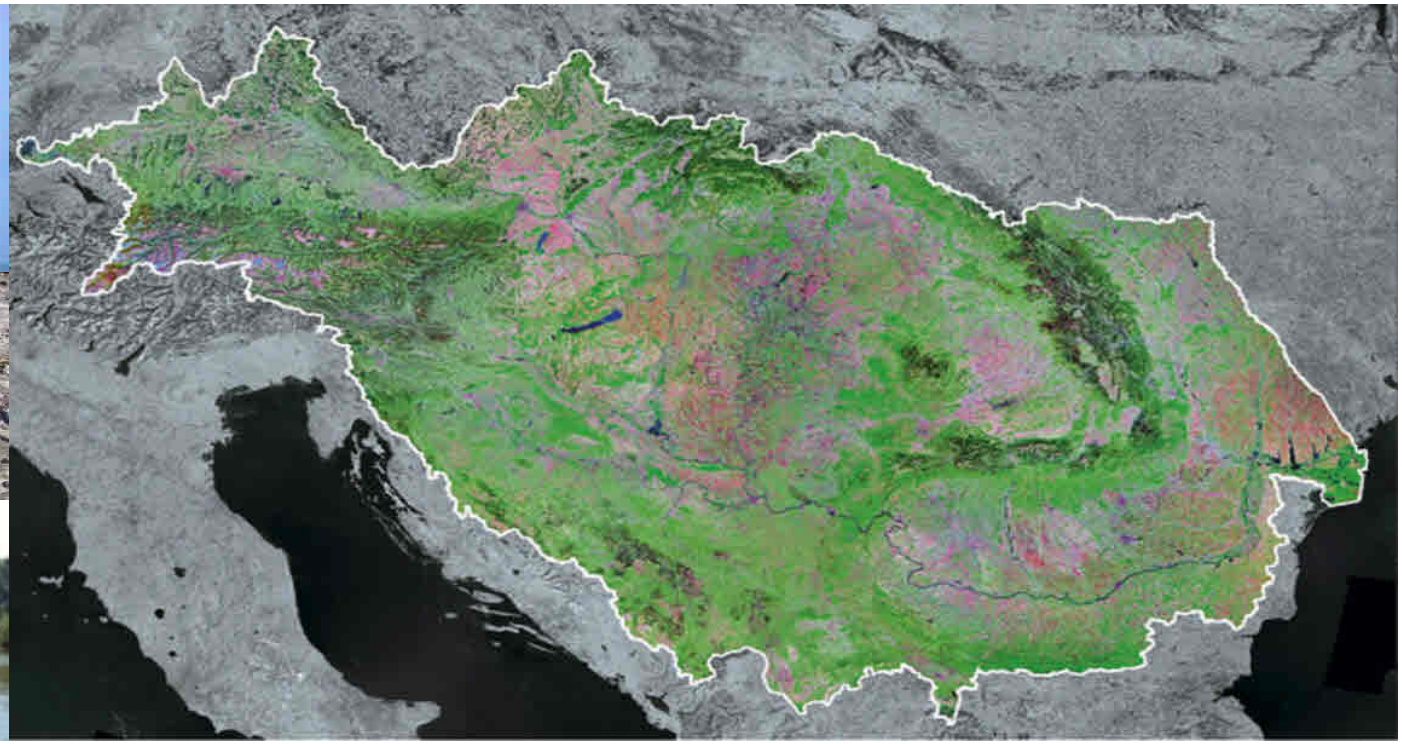
Management of Sediment Quality and Quantity in the Danube River Basin



5th SedNet Conference

27-29 May 2008

Oslo (N)

Igor Liska

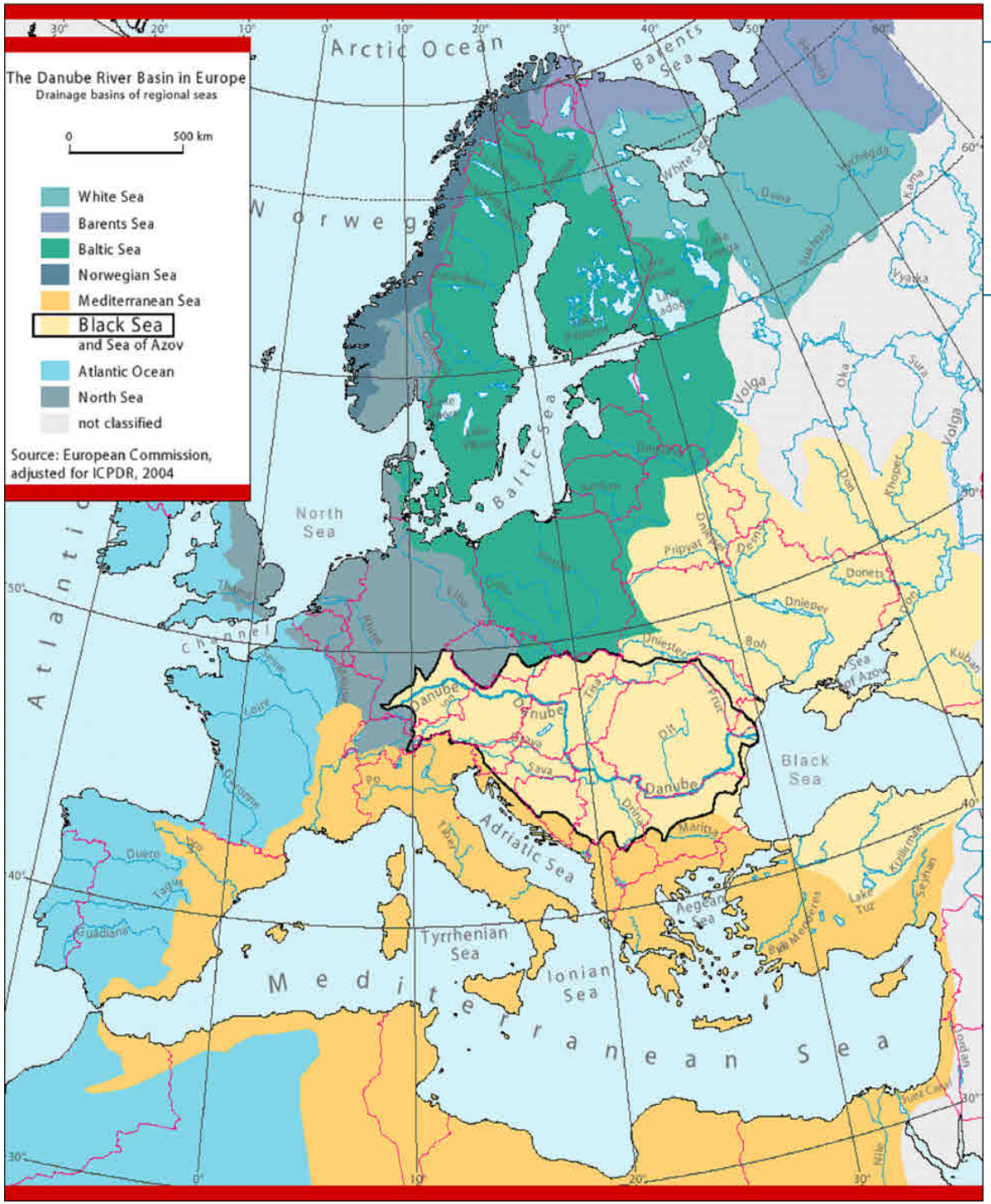
ICPDR

igor.liska@unvienna.org

CONTENT

- ⇨ ICPDR & EU WFD implementation
- ⇨ Sediment quantity & quality

ICPDR & EU WFD Implementation



icpdr iksd

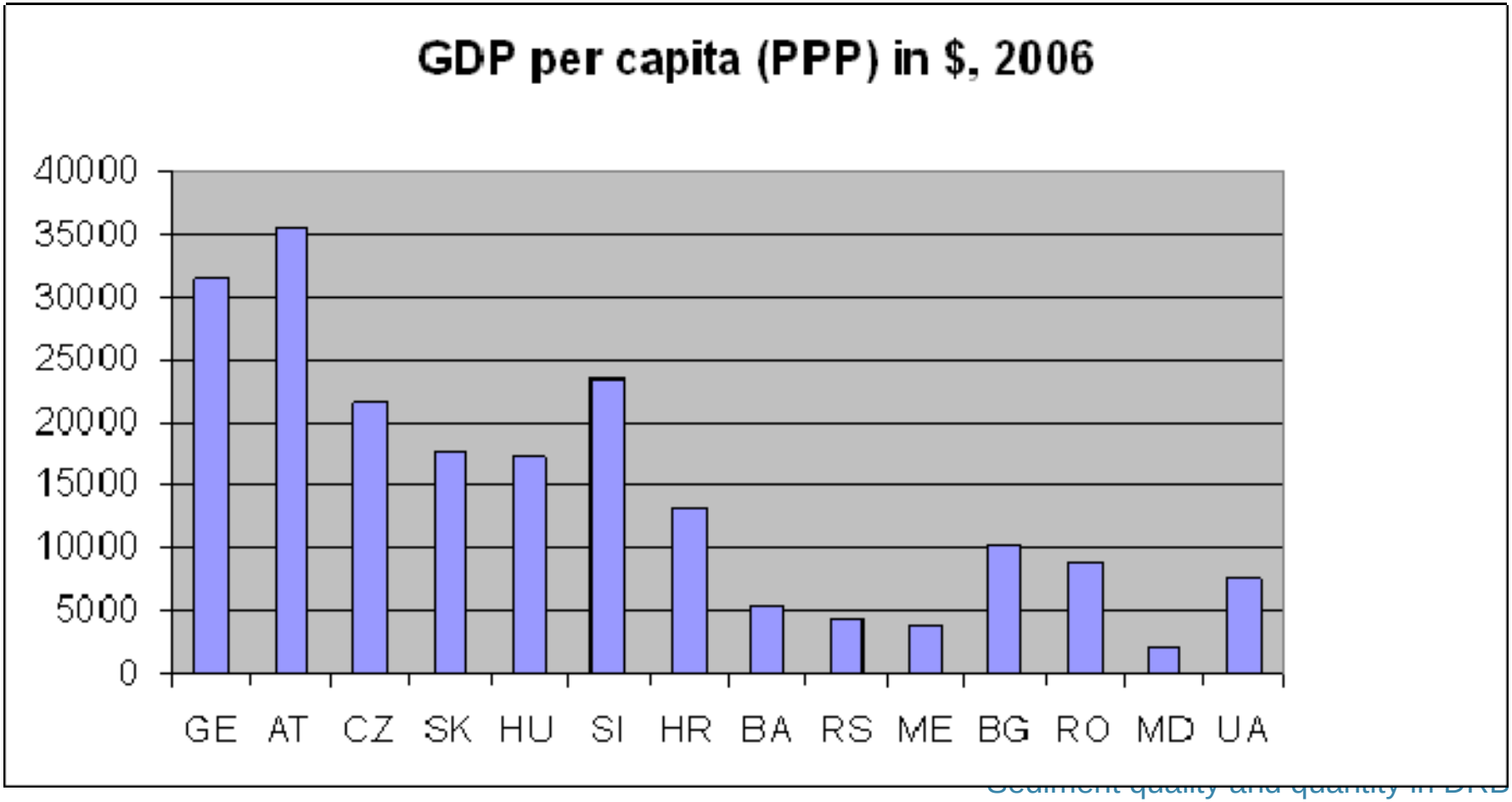
International Commission for the Protection of the Danube River

Internationale Kommission zum Schutz der Donau

- **10% of Europe**
- **83 mil inhabitants**
- **19 countries**

Most international river basin in the world

Economic Factors



The Danube River Protection Convention

Signed 29. June 1994

Entry into force 22. October 1998

Permanent Secretariat since 1 October 1999

A legal frame for co-operation to assure the protection of water and ecological resources and their sustainable use in the Danube River Basin

The International Commission for the Protection of the Danube River (ICPDR)

has been established to implement the objectives and provisions and to achieve the goals of the Danube River Protection Convention

Sediment quality and quantity in DRB
Igor Liska - ICPDR

Contracting Parties

- Germany
- Austria
- Czech Republic
- Slovakia
- Hungary
- Slovenia
- Croatia
- Bosnia & Herzegovina
- Rep. of Serbia
- Romania
- Bulgaria
- Rep. of Moldova
- Ukraine
- European Union

Montenegro (ratification process under way)

EU Water Framework Directive

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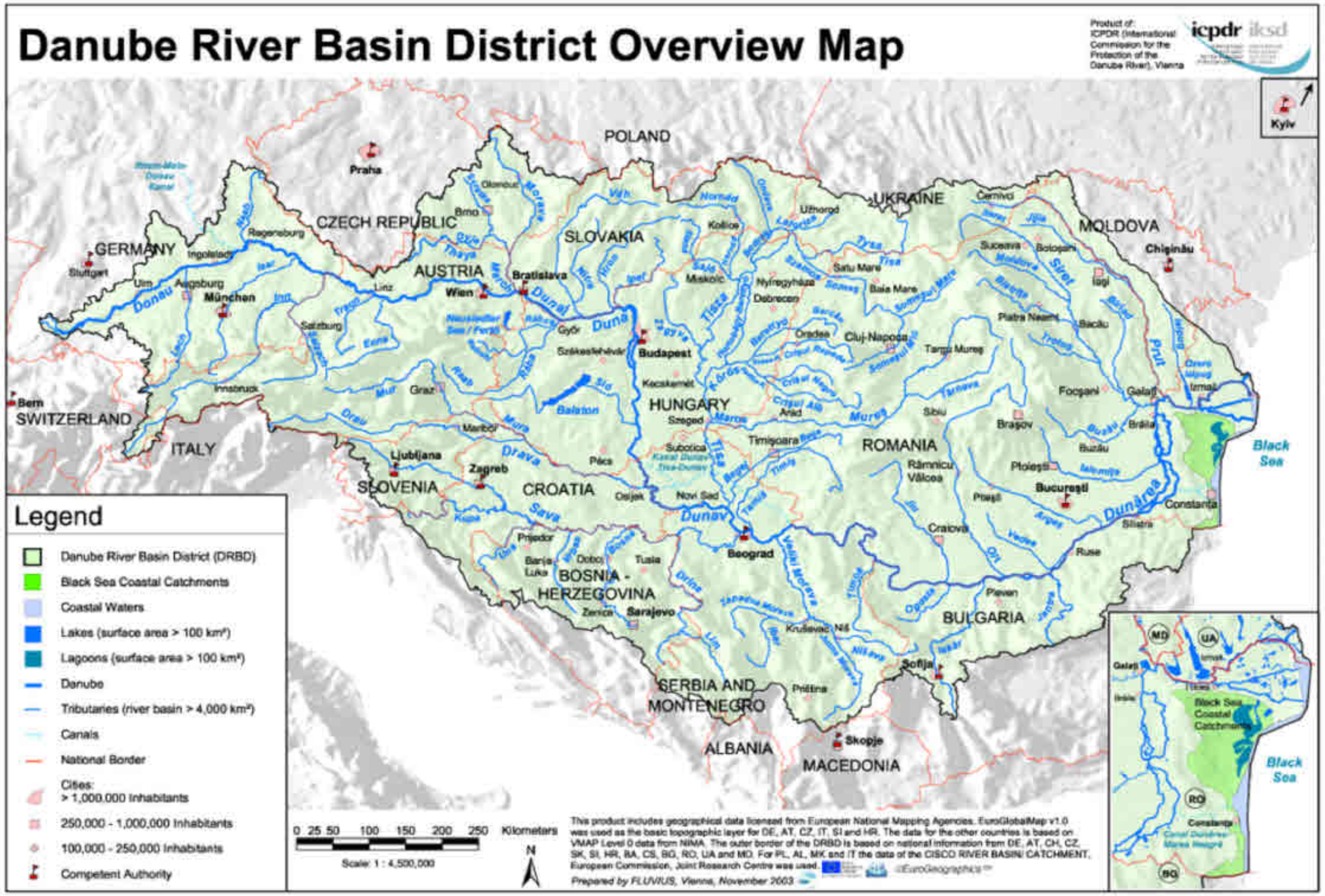
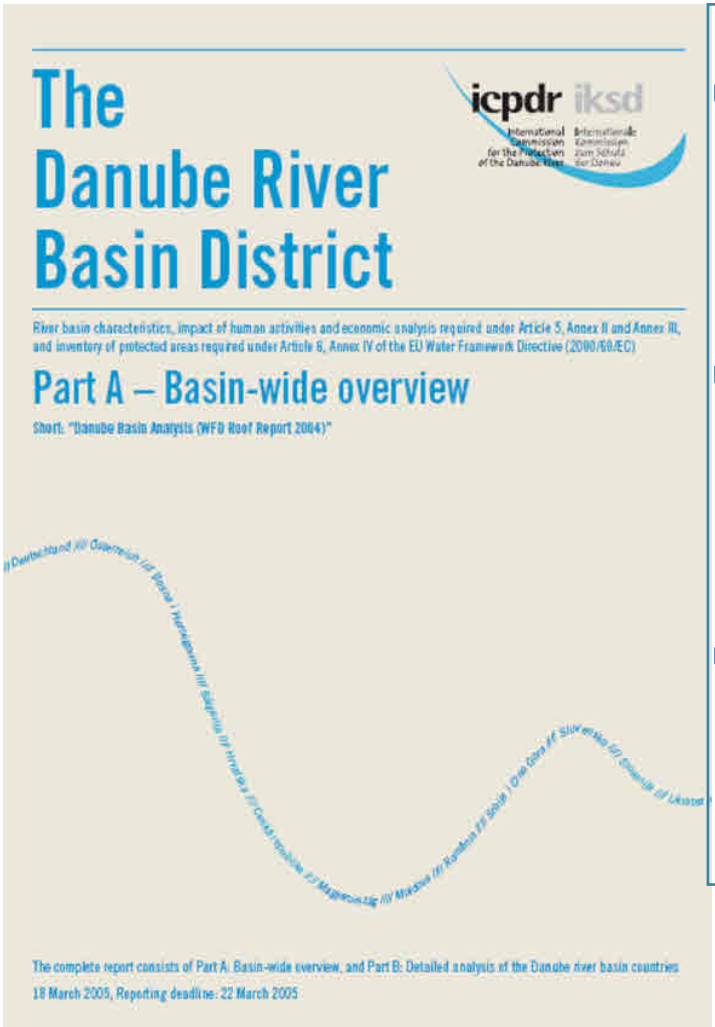


ICPDR – common platform for the implementation of EU WFD in the Danube River Basin

Sediment quality and quantity in DRB

Igor Liska - ICPDR

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

Significant Water Management Issues

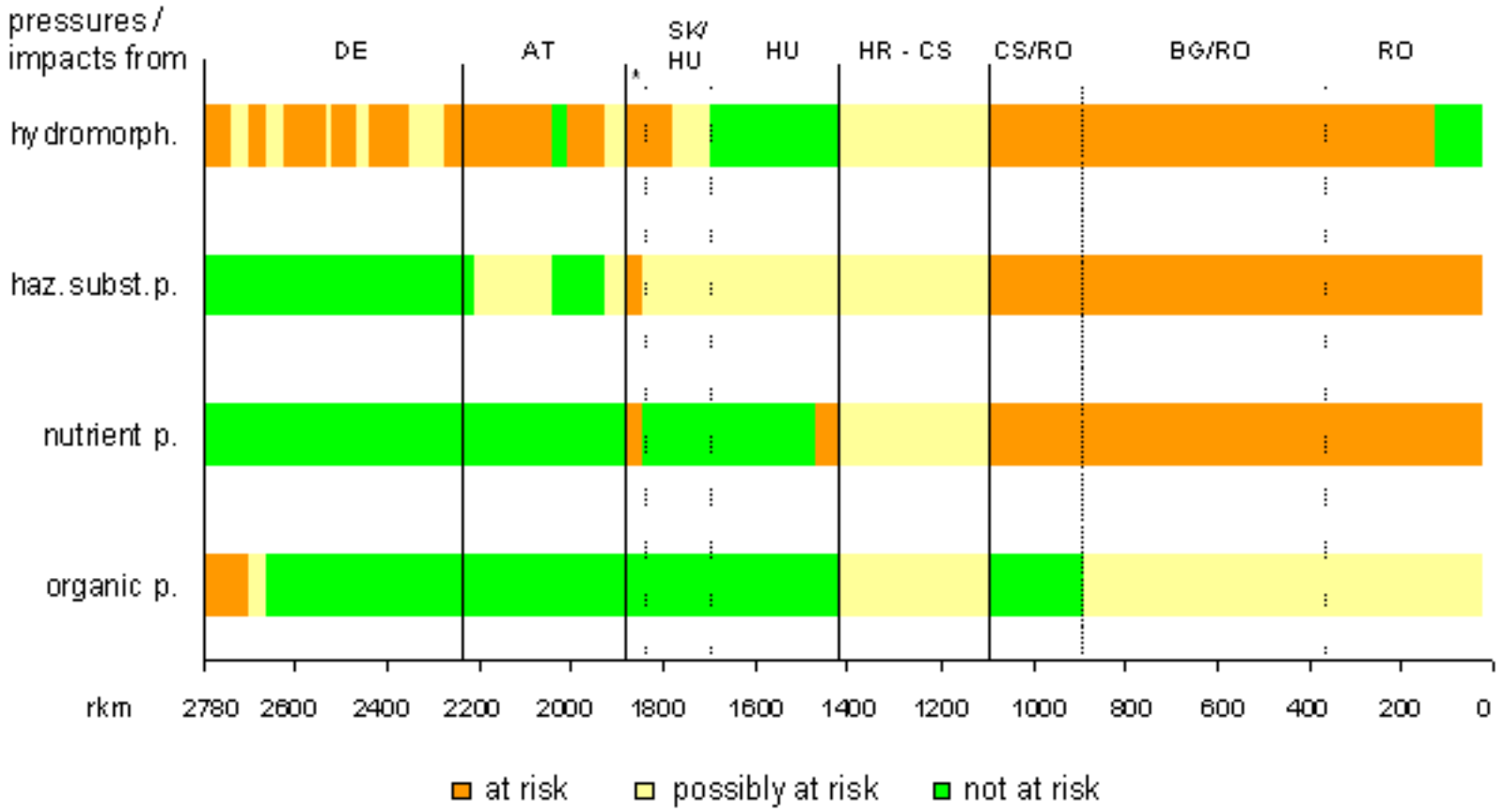
Organic Pollution

Nutrient Pollution

Hazardous Substances Pollution

Hydromorphological Alterations

Identification Significant Water Management Issues



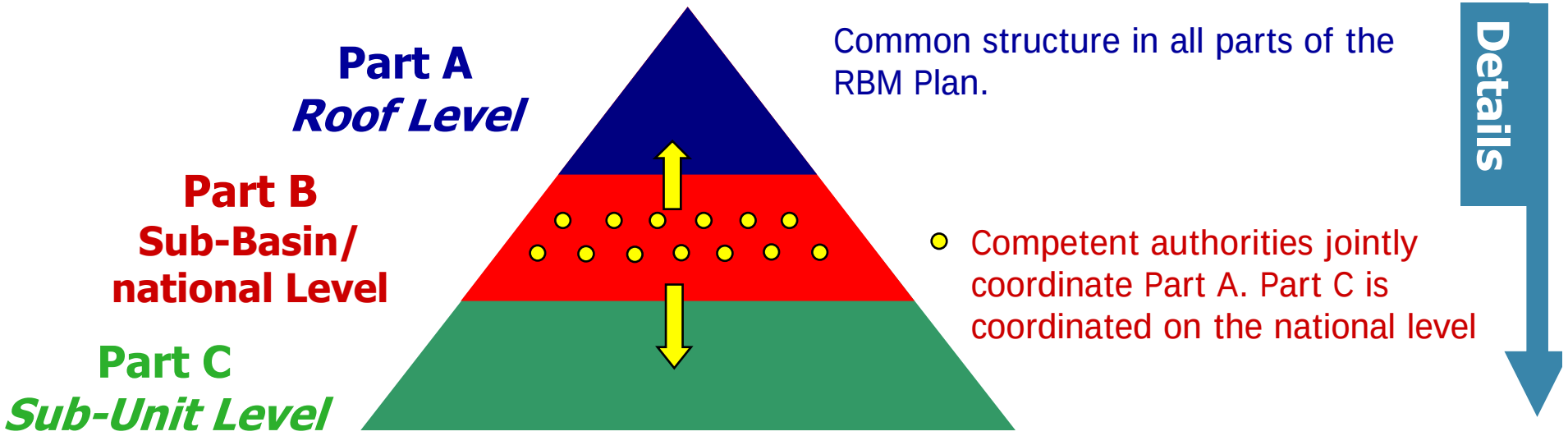
Sediment quality and quantity in DRB

Igor Liska - ICPDR

Danube River Basin Management Plan

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

good coordination mechanisms and a clear strategy including timelines are needed



Outline DRBM Plan 2009

1. **Introduction**
2. **Setting the Scene**
   - ⇨ Development DRBM Plan, Basin wide scale, Danube Basin Analysis
3. **Identified Significant Pressures in the DRBD**
   - ⇨ Rivers, transitional & coastal waters, Groundwater
   - ⇨ addressing each SWMI
4. **Monitoring networks and ecological/chemical status**
   - ⇨ Rivers, transitional & coastal waters, Groundwater
   - ⇨ addressing each SWMI as well as other significant issues (sediments)
5. **Environmental objectives and exemptions**
6. **Economic analysis of water uses**
7. **Joint Programme of Measures based on national PoMs**
   - ⇨ Rivers, transitional & coastal waters, Groundwater
   - ⇨ addressing each SWMI
8. **Water Quantity issues and Climate Change**
9. **Annexes**

Sediment quantity & quality

Damming and sediment transport

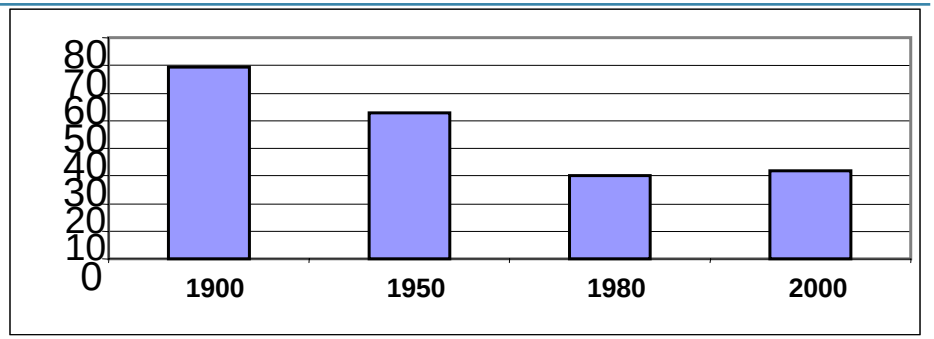
- Sediment accumulation in dams - extraction needed
  - ⇨Gravel extraction 15 000 m^3/a in Abwinden–Asten dam
  - ⇨In the Iron Gate, 325 million tons of sediment accumulated between 1972 and 1994, and filled 10 % of the entire reservoir capacity

- Reduced sediment discharge leads to riverbed erosion – artificial material donation necessary to stabilize riverbed
  - ⇨Austrian Danube downstream Vienna - the riverbed is eroding at a rate of 2.0 – 3.5 cm/year
  - ⇨downstream the Freudenau dam addition of 160 000 m3 bed load per year is required
  - ⇨Significant erosion downstream the Iron Gate

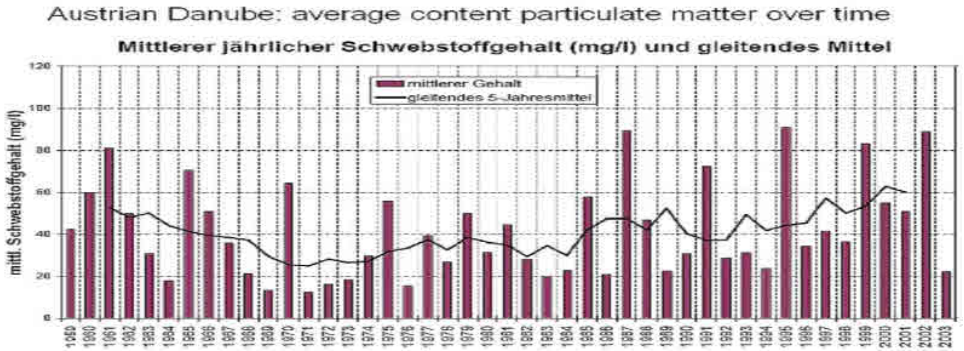
Sediment balance

Sediment deficit in the Danube due to damming and regulation works reported in the Roof Report 2004

No deficit of suspended solids reported in the upper Danube



SPM in Issacea in million tons/year



Sediment balance

- Accuracy of sediment transport assessment is essential:
  - ⇨ extreme flood event in August 2005 on the Inn at Innsbruck - 1.74 mil. tons transported
  - ⇨ annual sediment load in 2004 - 0.82 mil. tons

- Cooperation with IHP/UNESCO - project on assessment of the sediment balance in the Danube River

Dredging

- Securing waterway transport
- Danube Delta: in 1960 – 1990 canals dredged to optimize water circulation needed for fish farming
- Dredging for construction purposes (HU/SK)
- Cooperation with CEDA on formulation of environmental aspects of dredging in the Danube River

Joint Danube Survey

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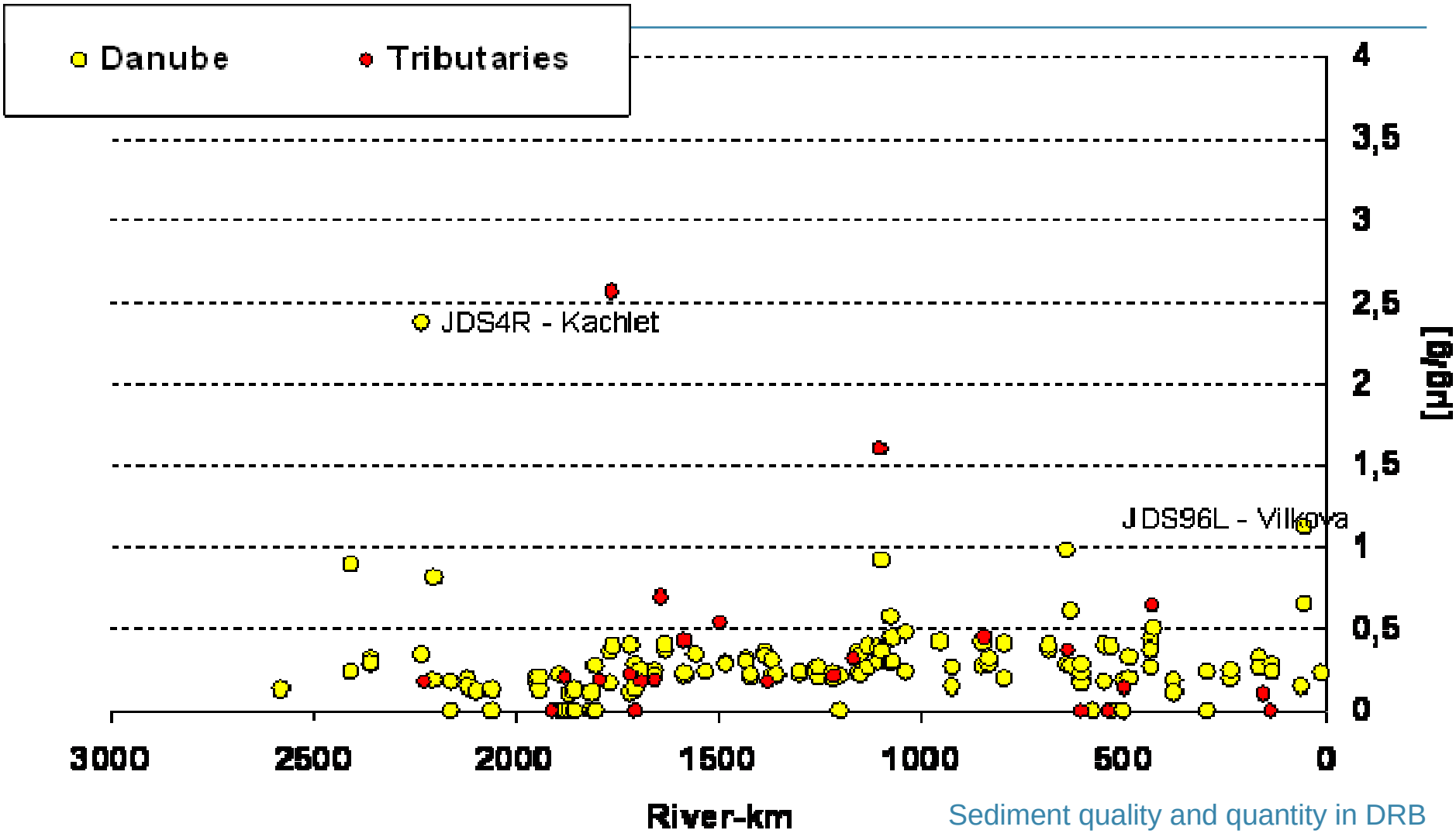
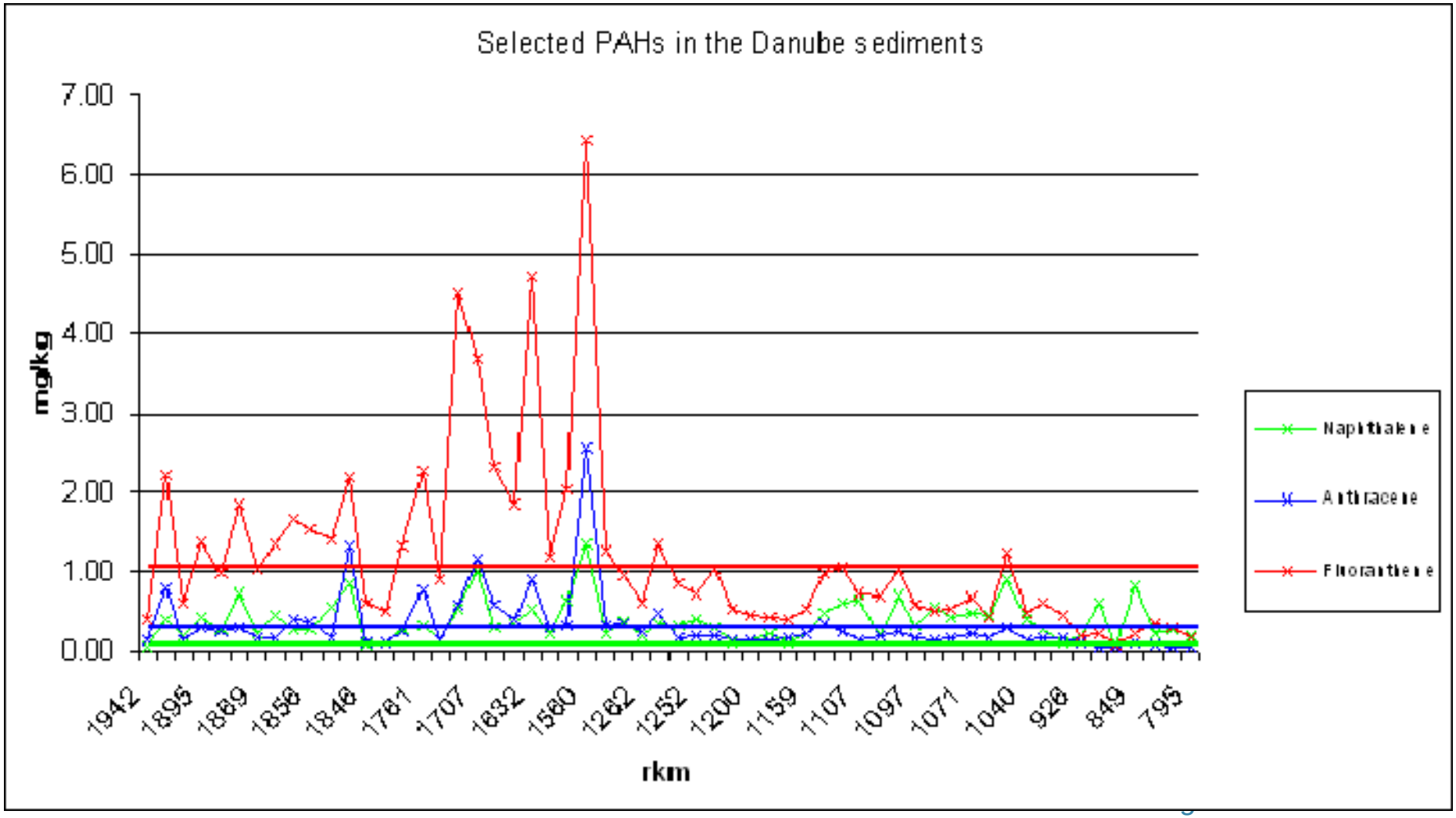
Mercury in Sediments



PAH - Aquaterra



JOINT DANUBE SURVEY 2

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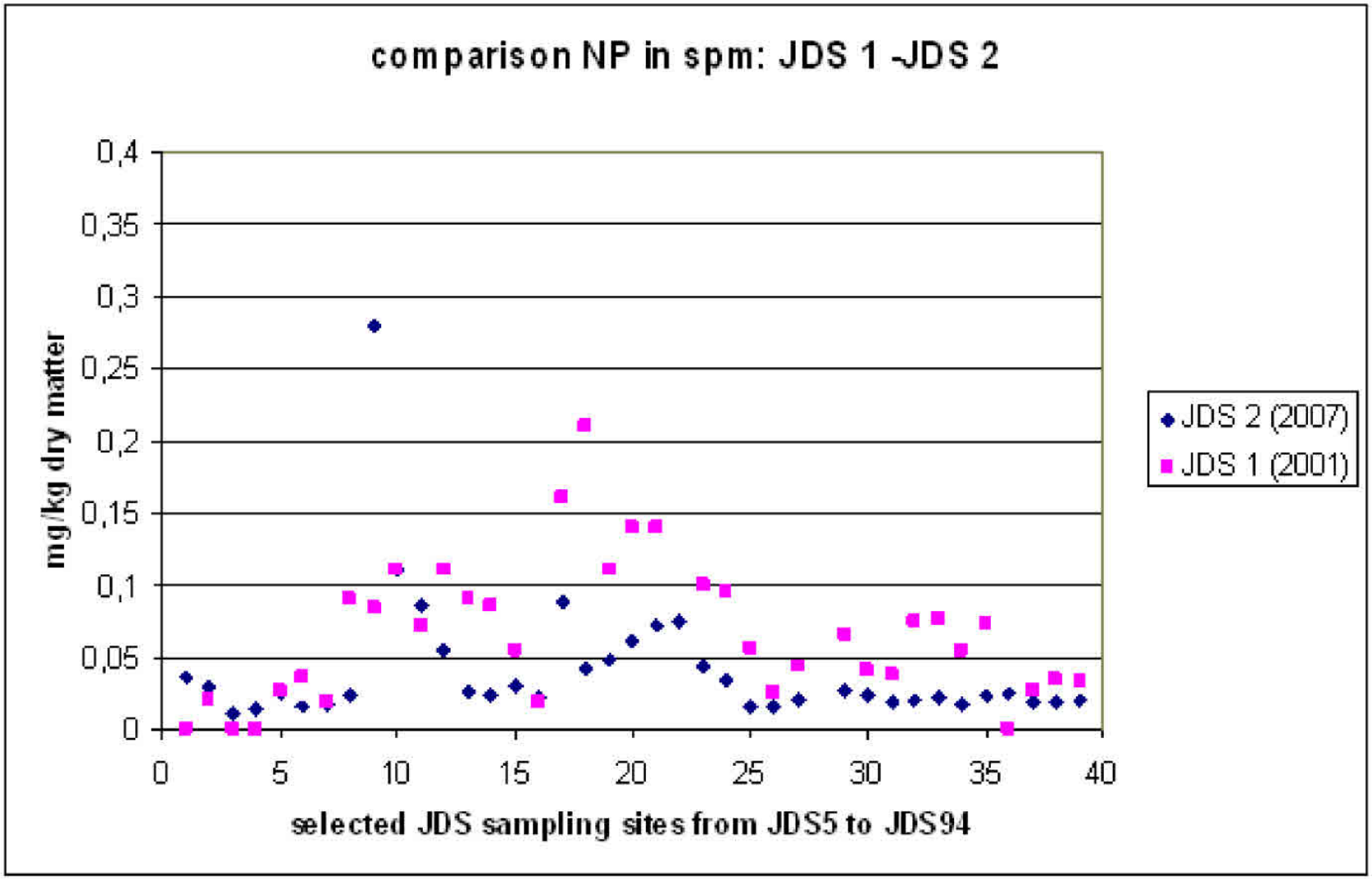
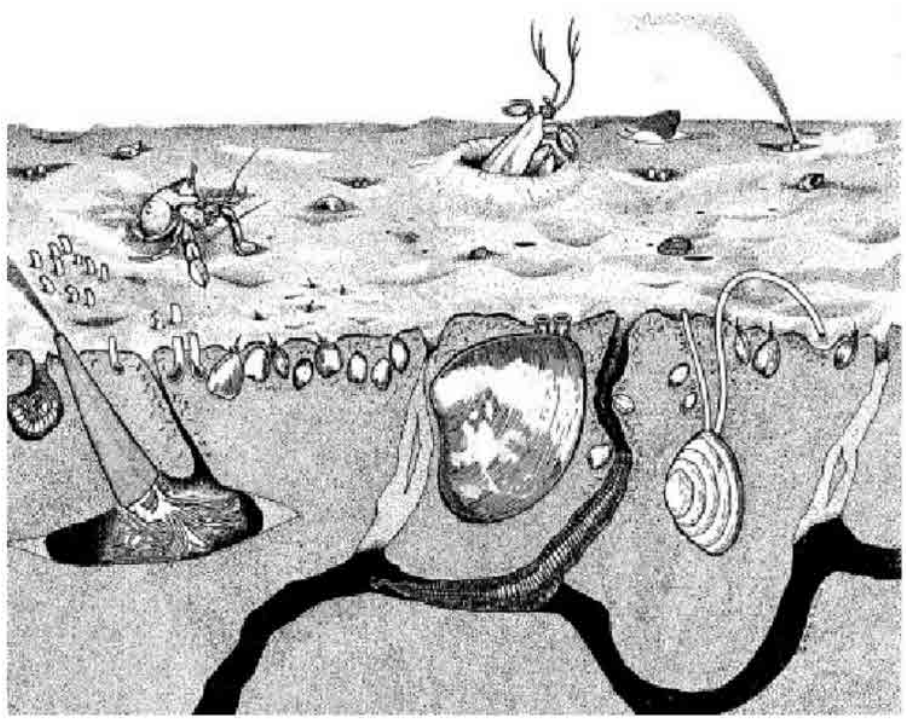


Sediments are ecosystems *per se*



From US-EPA (1993). Provisional guidance for quantitative risk assessment of polycyclic aromatic hydrocarbons. EPA/600/R-93/089.

Toxicity of contaminants in sediments depends on various factors :

- **Physical factors**:
  grain size, pore water, gas content, temperature
- **Chemical factors**:
  organic matter, redox conditions, pH, ammonia, sulfides
- **Biological factors**:
  macrobenthos density and bioturbation, microbial activity
- **Anthropogenic activities**:
  dredging, fluvial transport, etc.
- **Meteorological and hydrological conditions**

⇒ Harmonisation needed for toxicity testing and monitoring

Thank you for your attention

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Internationale Kommission zum Schutz der Donau

For more information, please visit

www.icpdr.org

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