

# **“Sediment Management – an essential element of River Basin Management Plans”**

**Report from the SedNet Round Table Discussion  
Venice, 22-23 November 2006**

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# SedNet Partners

Project funding 2002-2004



European Commission  
DG Research

Project partners 2005+



Venice Port Authority



Rijkswaterstaat



Netherlands Organisation for Applied  
Scientific Research



Bundesanstalt für  
Gewässerkunde



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# Round Table Objective

- WFD River Basin Management Plans (RBMP) in 2009.
  - Sediment management (quality and quantity) should become a part of these plans, which will mean that scientific and practical guidance is needed how to consider sediment management issues.
- ➔ Recommendations for sediment management based on experiences taking into account legal requirements, needs of users and scientific advice.



# Round Table River Basins



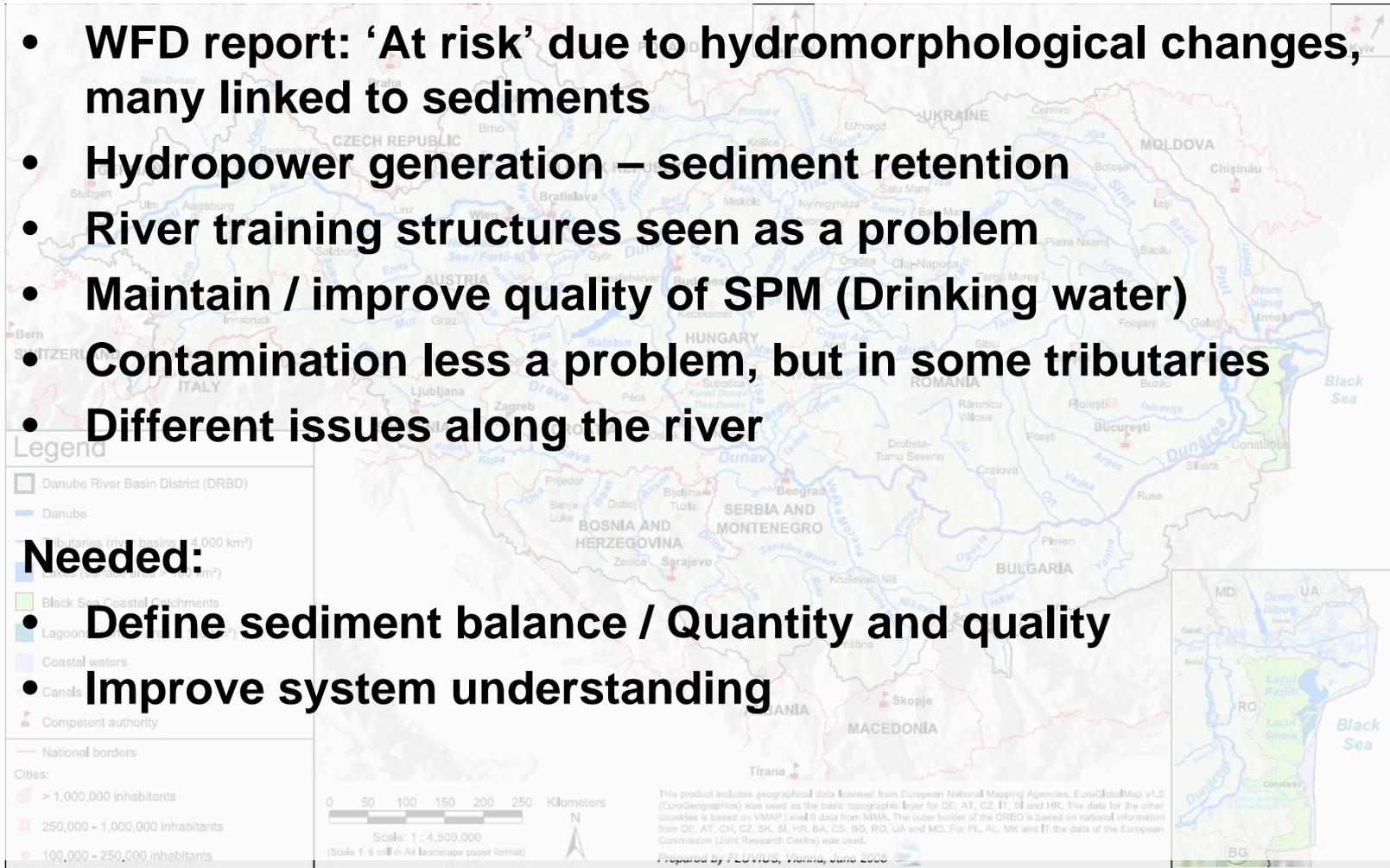
Delegates from river commissions,  
user groups, science

# The Danube

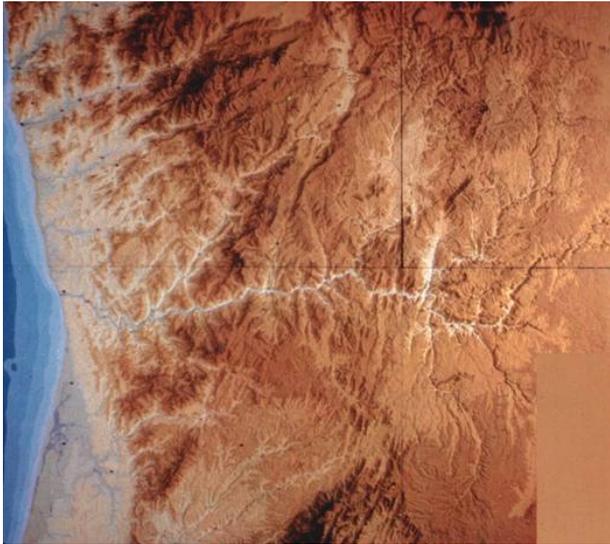
- WFD report: 'At risk' due to hydromorphological changes, many linked to sediments
- Hydropower generation – sediment retention
- River training structures seen as a problem
- Maintain / improve quality of SPM (Drinking water)
- Contamination less a problem, but in some tributaries
- Different issues along the river

## Needed:

- Define sediment balance / Quantity and quality
- Improve system understanding



# The Douro



- Sediments mostly sand and gravel
- 39 multipurpose dams
- Accumulation of sediment in reservoirs
- Flood control only up to medium floods; no control of extreme floods; then material is flushed downstream
- Sand / gravel extraction (2 Mio. tonnes/year)
- Some dredging in the estuary in Porto
- Sediment contamination needs to be addressed

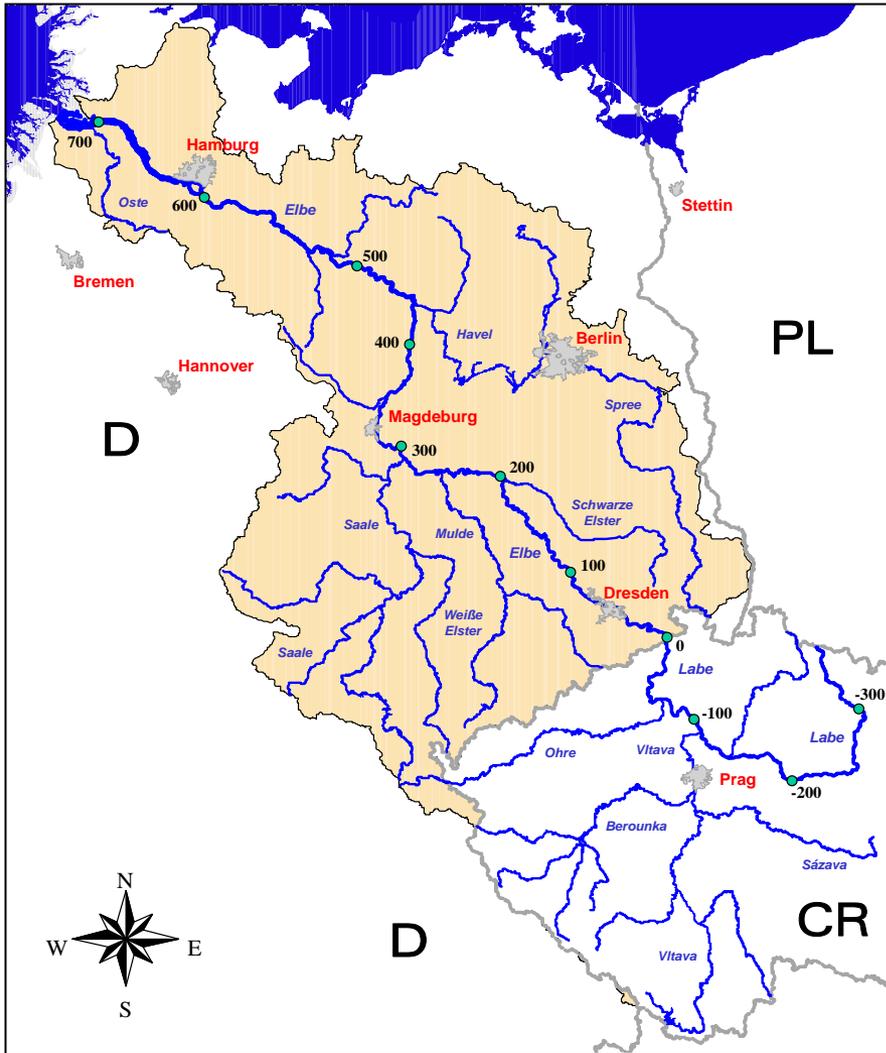
# The Douro / Statements

- Sediment deficiency in the river system worsens erosion at the coast.
- The extraction of sand and gravel has a negative impact on the morphology of the river bed.
- Sediment quality is not a priority with regard to sediment management and water quality in the Douro but needs to be addressed.
- There are a number of current management plans which partly address sediment issues but which are regionally based.

**A sediment management plan (quality, quantity, water, soil, land use) is needed; institutional cooperation will be necessary.**



# The Elbe



WFD Art. 5 report /  
Germany:

2/3 „at risk“ due to  
hydromorphological  
changes and  
contamination

# The Elbe / Interests & challenges

- Necessary maintenance of inland waterways
- Dioxin contamination of floodplains resulting in exceedance of feed and food standards
- Sediment management in the Port of Hamburg
  - Relocation and North Sea disposal
  - Dredged Material disposal on land
- Estuary management for navigation, flood protection, nature conservation, tourism, fishery to be developed



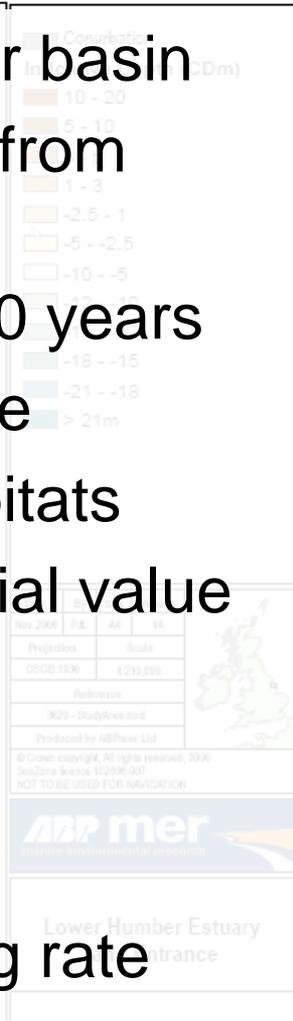
# Sediment quality

- Contamination is a problem for the river and the sea and can only be solved on river basin scale
- 3-step strategy, taking into account all interests and uses:
  - Substances of concern
  - Areas of concern
  - Areas of risk
- Prioritisation and adapted remediation
- Costs for remediation have to be shared on supra level
- Transition concepts are necessary



# The Humber

- The largest and best monitored English river basin
- WFD report: 100 % of TraC waters “at risk” from morphological pressures
- Land reclamation from the estuary since 400 years
- Long-term sustainable plan for flood defence
- Nearly all of the estuary are designated habitats
- Important port facilities – economic and social value
- Intensive shipping in the estuary
- Dredging is necessary (~ 7 Mio. m<sup>3</sup> p.a.)
- Most sediment comes from the sea
- Contamination of sediments with decreasing rate



# The Humber / Results

- Consider constant changes in estuaries
- Sediment management is a clear need
- Look at issues on broader scale and seek for win-win solutions
- WFD risk assessment is too blunt; good system understanding is necessary to identify real issues
- Habitats + WFD requirements - Sediments as part of a healthy ecosystem
- Good communication is necessary
- Maintenance dredging protocol for dredging under Birds and Habitats Directive; support from ports and NGOs



# Conclusions

- Sediment Management is an issue in all 5 river basins (together with the Rhine).
- Each river basin has specific natural characteristics, uses, history, challenges.
- Estuaries are different from rivers; until now thinking is very 'fluvial'. Differences expected for e.g.:
  - Time scales
  - Effectiveness of measures
  - Close linking of sediment management to environmental / climate change issues



# Conclusions

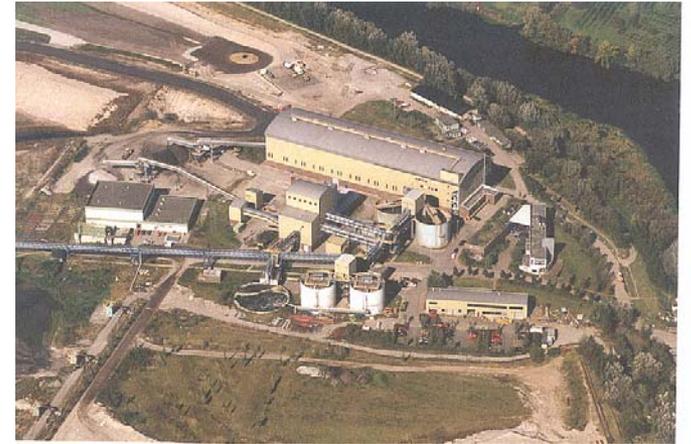
- Integration of requirements of different European and national pieces of legislation can be challenging.
- EU Policies may create conflicting ambitions.
- Good ecological status requires proper attention to sediment issues.
- Sediment EQS values should be regarded as high level screening values.
- Sediment quantity and quality issues are closely interrelated and can not be separated



# Recommendations

- Collate available data to identify knowledge gaps and enhance understanding.
- To develop River Basin Sediment Management make use of
  - existing methodology and information
  - existing guidance
- Draw on other river's experiences.
- EU should not only support problem identification, but also problem solving processes.





Thank you for your attention



... and have a look at [www.SedNet.org](http://www.SedNet.org)



<b>WFD Surface Water</b>	<b>WFD Groundwater</b>
Not at risk of failing the WFD objectives: 12 % Possibly at risk of failing the WFD objectives: 25 % At risk of failing the WFD objectives: 23 %	Not at risk of failing the WFD objectives: 44%  At risk / possibly at risk of failing the WFD objectives: 56 %

- Morphological and hydromorphological changes
- Diffuse sources of nutrients and pollutants
- Point sources of nutrients and pollutants
- Groundwater: diffuse nitrogen from agriculture, point sources, e.g. contaminated sites, mining, etc.



The Commission Regulation No 466/2001 of 8 March 2001 sets maximum levels for foodstuffs, e.g., heavy metals and dioxins. Moreover, the European Union developed a concept to minimize the contamination of feed and foodstuffs with dioxins and furans.

The dioxin levels in feed and food measured in Lower Saxony (*and presumably at other floodplain sites*) after the Elbe flood of 2002, were sometimes significantly above the fixed maxima.

Requirements on the side of the EU Commission:

- Financial support for adaptation of agricultural management
- Financial assistance for reorganization of farm enterprises
- Moderation of the regulations for a transitional period

The bedload management of WSD Ost serves the restoration and maintenance of the navigable depth of the fairway in the River Elbe using two basic methods: (1) bedload relocation (dredging) and (2) artificial bedload supply. Artificial bedload supply is practised in the Elbe reach between river-km 120 and 230, where excessive erosion prevails, by regular dumping of borrow materials from gravel pits.

The bedload-management practice in the River Elbe follows the guidelines of the Directive for Management of Dredged Material in Inland Waters of the Waterways and Shipping Administration (HABAB-WSV). Since the relocated material consists only of coarse sediment fractions, there are no contaminants adsorbed.

### River Board Representative (extract)

- Polluter-pays approach, especially for nutrient emissions
- Contaminant transport with sediments primary attention
- Handling of chemical pollution on the river basin scale
- Costs of problem solutions, possibly from a joint fund

Scientific advice (economy): (1) organization of joint fund, (2) shared-burden approach for special problem areas?

User group “agriculture“, request from EU Commission:

- Financial support for adaptation of agricultural management
- Moderation of the regulations for a transitional period

Scientific advice: (1) PCDD/F analyses, (2) soil/animal transfer, (3) “floodplains” (input/output balance, remediation)

## Discussion: Decision making, threshold values, additional weight of evidence

- Is the site erosive or depositional? Will management options change that, with risks to downstream sites?
- Complexity of sediment transport processes and associated uncertainties is usually fostering the application of the precautionary principle, i.e. removal as expensive solution
- Possible major improvement could be through incorporating multiple lines of evidence around probabilities (rare events!)
- Joint function of many river ports within the “catchment-coast continuum” as sediment traps but increasingly as sources for relatively cheap sea disposal. What is the yardstick for both?
- Weight of evidence for risks on downstream target areas from the precision of the term “indications that resuspension occurred”, e.g., from sediment cores, indicator substances ...