Report from the SedNet Round Table Discussion

22-23 November 2006

"Sediment Management – an essential element of River Basin Management Plans"

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Objectives

- WFD River Basin Management Plans (RBMP) have to be produced and published 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
- Develop conceptual approaches on how to address sediment related issues based on legal requirements, needs of users and scientific advice

WFD CIS / Hydro-morphological pressures

Supplementary measures for sediment transport management (December 2006)

Sediment transport is a key consideration for certain water uses and in determining hydro-morphological status or physical alterations at the river basin scale.

Sediment transport is not directly addressed by EU specific legislation. Given the impacts of sediment on water uses and/or aquatic habitats, supplementary measures dealing with sediment transport management could be part of the (sub) basin river management plans to support the achievement of the WFD objectives.

Important:

restore sediment transport continuity

preventive approaches

Improvement of knowledge and understanding of sediment transport at the river basin scale

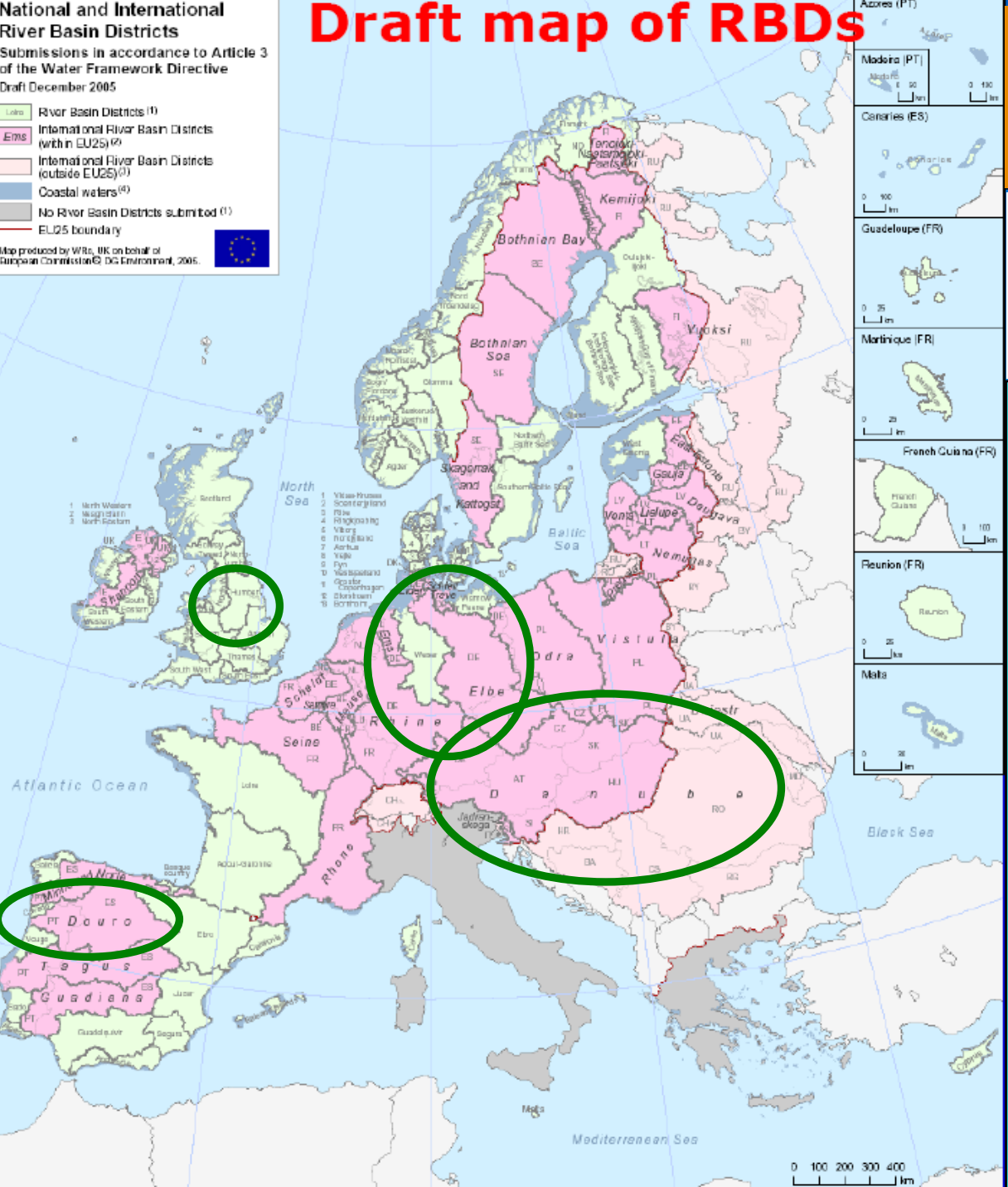
The Round Table Discussion

Brought together

- River Basin Managers
- User Group representatives
- Scientists

From 4 selected European River Basins

- Danube
- Douro
- Elbe
- Humber



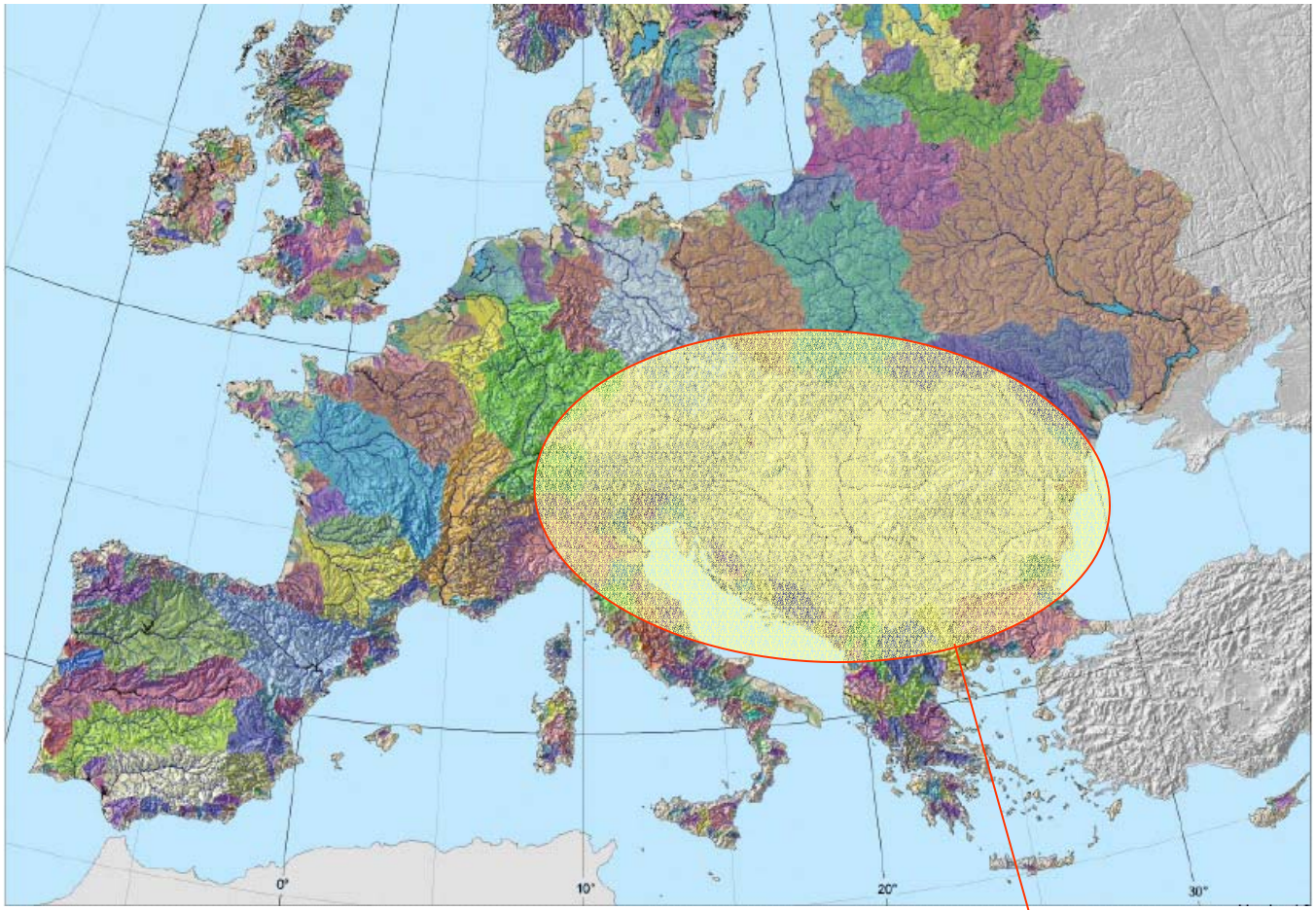
Round Table River Basins

Currently (for 23 MS):

- 96 RBDs
  - ➢ 69 national
  - ➢ 27 international
- Norway:
  - ➢ 14 RBDs
- RO, BG, HR:
  - ➢ 9 RBDs

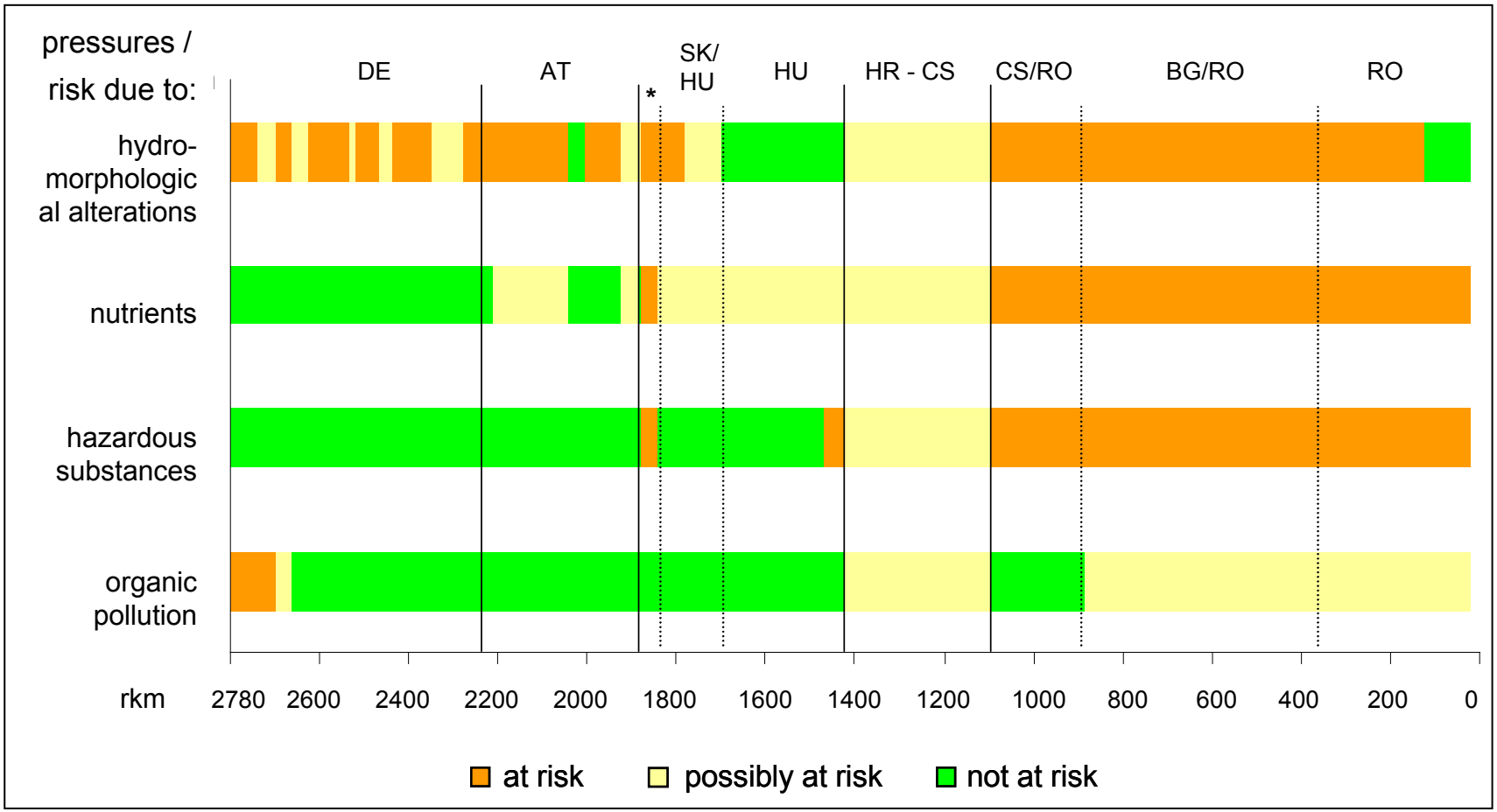
Format for the round table

- Interests
- Challenges
- Expectations
- How to move forward in sediment management at the river basin scale



Danube:
18 countries from the EU
'richest' to 'poorest'

Interests: risks identified along the Danube (ICPDR)



Interests and challenges (2)

Hydropower:

- Upper area: flushing sediment/fine material from reservoirs to keep them functioning and increase flood protection capacity
- Results in high sediment load: turbidity, impact on fish breeding
- But how to differentiate natural variability from anthropogenic influence ?
- Note: each case is different

Drinking water production:

- Protect resources: surface & ground water
- Maintaining or improving water phase/water quality + SPM + sediment
- Should help to avoid using costly techniques (e.g. ozonation).

Interests and challenges (3)

All (ICPDR, Science,Users) agree:

- Measures supporting navigation (DG Transport) (river training works & dredging) are pressures which do not go well with idea of natural/dynamic rivers (DG Env/WFD & WWF)
- Sediment (fine material) deficit/river bed degradation perceived as issue in lower part (Romania) and some sections upper part (bed load/bed incision; WWF)
- However, on average quantity of sediment is the same due to flushing (upstream); the change is that temporal variability increased (science)

Interests and challenges (4)

All (ICPDR, Science,Users) agree:

- Main channel/lower part also quality issues (DDT an other persistent pollutants), but in general quantity is the issue.
- Sediment quality in (some) tributaries much worse than in Danube main channel (risk on secondary poisoning/food chain)
- Agriculture in Danube more impact on ground water than (contaminated) sediment in flood plain: flood plains have good ground water quality
- Nutrient load is up stream and down stream issue. A significant load comes also from upstream countries
- Please do not create new problems, we already have so many issues to solve: come with solutions for existing problems

Interests and challenges (5)

All (ICPDR, Science,Users) agree:

- Situation can differ from case to case
- And also in the different stretches of the Danube:
  - Upper (origin – Gabcikovo)
  - Middle (Gabcikovo – Iron Gates)
  - Lower (Iron Gates – Black Sea)
  - Delta
  - Tributaries
  - Reservoirs

Expectations

Get towards an advice on the implementation of sediment management in the Danube WFD River Basin Management Plan

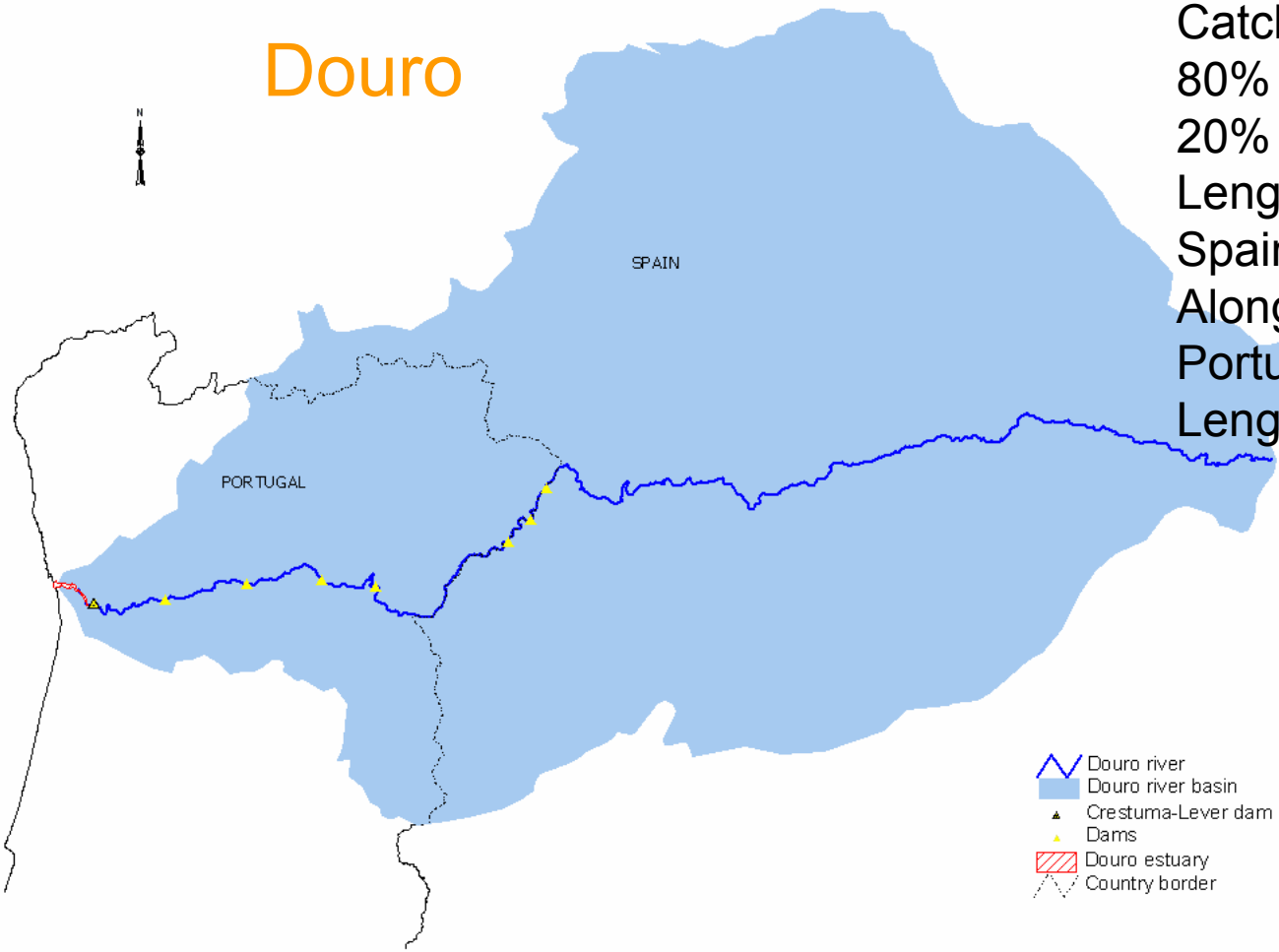
Action required, in order to:

- Define the sediment balance
- Improve the understanding of the system

Supported by:

- SEDAN representatives from 13 Danube countries
- IHP Danube countries coordinator
- ICPDR
- Hydropower & drinking water producers
- UNESCO-BRESCE
- University of Novi Sad
- SedNet

Douro



Catchment area 97 700 km^2
80% in Spain
20% in Portugal
Length 850 km
Spain: 525 km
Along the border 112 km
Portugal: 213 km
Length of the estuary: 22 km

Basin features

Sediment properties:

- Large annual flow variability (few hundred m^3/sec - 17 000 m^3/sec)
- Douro flows through montaineous region, cutting a trench in the rocks
- Hence sediment is almost exclusively sand and gravel

Morphological features:

- 39 multipurpose dams
- Flood control through reservoirs only with small to medium floods
- No control of extreme floods
- In case of large floods, material is flushed downstream
- Dams cause reduction of flow velocities
- Probable reduction of sediment load
- In reservoirs: accumulation of sediment is used for gravel extraction

Basin features

Estuary

- Highly energetic estuary (tides, waves, river discharge)
- Sand spit in the estuary has moved inland (750 m since 1854)
- Extraction of sand for civil construction
- Dredging works for navigation in the estuary
- Coastal erosion south of the mouth


Damage to estuary banks by waves due
to retreat and to overtopping of the spit

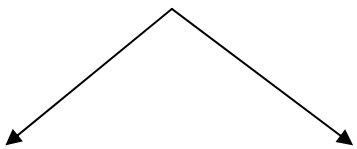
Challenges

Sediment deficiency in the river system worsens coastal erosion

Sediment is been taken out of the system:

Maintenance dredging in the estuary

Aggregate extraction for Construction



Relocation in the estuary

Used for construction purposes

Sediment deficiency in the river system: what can be done

Challenges

Management of sediment use:

Maintenance dredging in the estuary

Aggregate extraction for Construction

Relocation in the estuary

Used for construction purposes

Challenges

What can be done: integration of all user interests

Deal with local opposition against reduction of gravel extraction

Protection of river mouth

Protection of the coastal zone

Safety issue: Protection of communities at the southern coastal stretch

Protection of facilities and communities in the estuary

Integration of interests of river and land users,
Participation of stakeholders in the decision making process

Expectations

More information on sediment dynamics (River and Estuary):
Determination of sediment loads through periodic surveys at different discharges in order to understand the process

Regional river administration of the Douro → mandate to experts

Financing by harbour authorities & national and regional water authorities

Data base of the water authority should be extended by these data

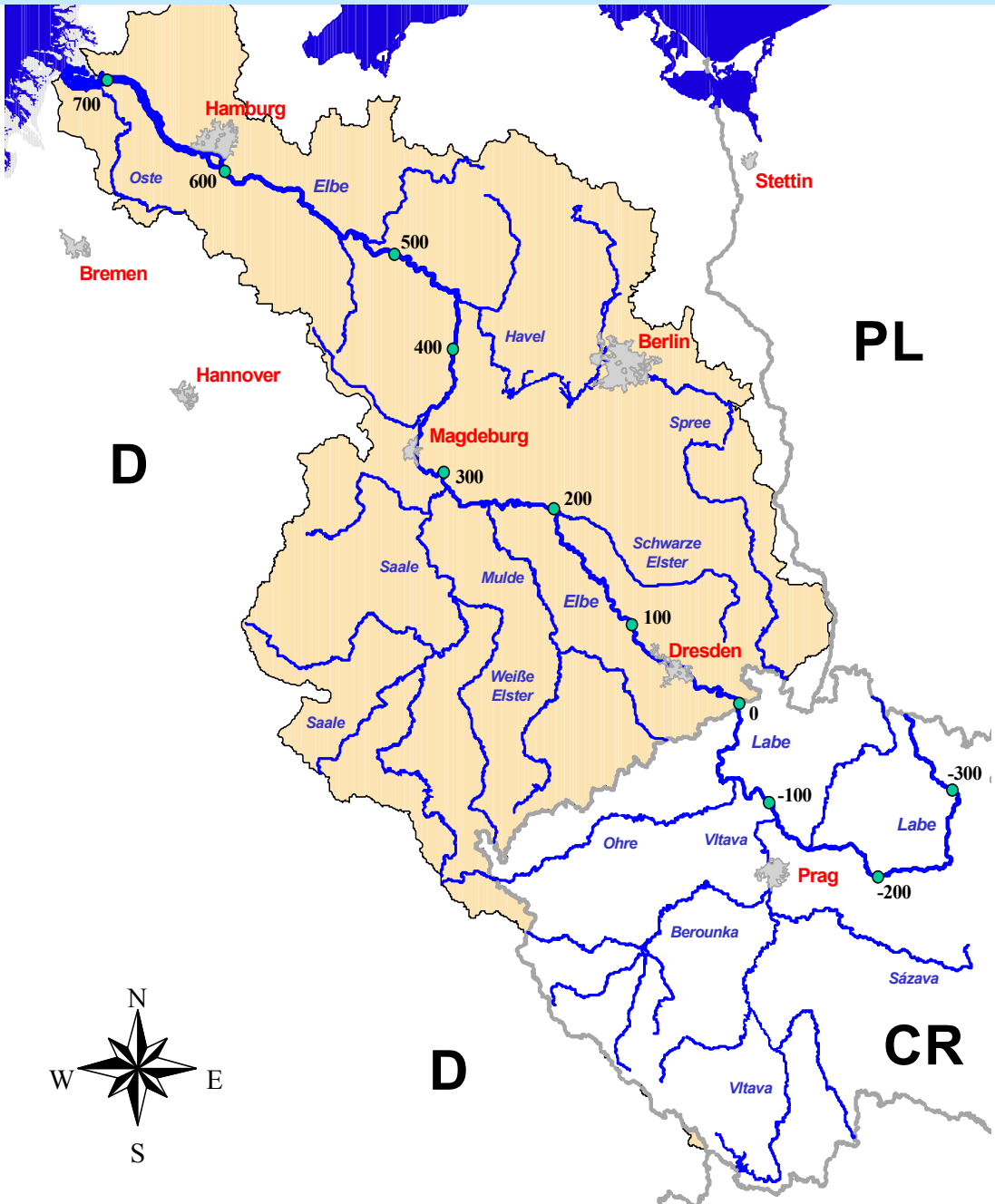
Strictly reduced extraction
Material dredged inside the estuary should be relocated purposefully with regard to quantity and quality

Development & implementation of a specific sediment management plan, focussed on sediment, integrating sediment quality, quantity, water, soil, and land use.

Start program to evaluate and assess the effects of the measures (institutional cooperation, involving different stakeholders)

SedNet

Elbe River basin: catchment area overview



Area: 148,286 km²

(65% Germany;
34% Czech Republic)

Length: 1.091 km

Average discharge: 862 m^3/s

47.8 % arable land
26.8 % forests
12.8 % grassland
8.0 % settlements

River report WFD

WFD Surface Water	WFD Groundwater
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.

Interests

WSD Ost
Quality: To get clean sediments as soon as possible
Quantity: To keep up the present management practice; to reduce the amounts of dredged sediment/bedload supply

Agriculture
Quality: To get clean sediment as soon as possible in order to fulfil QS in food production (EU 466/2001)

HPA
Quality: To get clean sediments as soon as possible in order to fulfil marine disposal requirements
To reduce the maintenance efforts (quantity and costs)
To bring back tidal regime and hydromorphological conditions of the whole estuary to more natural conditions

FGG
Quality: To reach compliance with EQS (PS);
To meet quality standards in support of a good ecological status
Quantity: To improve hydromorphological conditions in support of a good ecological status

WSD = Waterway & shipping Directorate
HPA = Hamburg Port Authorities
FGG = German river basin community Elbe

Expectations

WSD Ost

- To take measures for minimising the input of contaminated sediments into the inland harbours – IKSE – medium-term
- To be free in optimising the quantitative management practice (river engineering vs. dredging/bedload supply) and to agree on that within the RBMP – FGG - 2009

Agriculture

- Financial support for farmers to adapt the agriculture management and moderation of the regulations for a transitional period – EU commission – short-term
- To take measures for minimising the input of contaminated sediments into the floodplain (concerns hot spots upstream and interim sources like groyne fields) – FGG – medium-term

HPA

- Development and implementation of an integrated and overarching Elbe estuary concept, taking into account different user interests – (FGG) – to be started now
- Transition concepts and regulations for sea disposal of dredged material - short term; then bound them to River Basin Sediment Management Plan – FGG – short to medium-term
- Clarification of EU legislation concerning several sediment/dredged material issues – EU commission - short-term

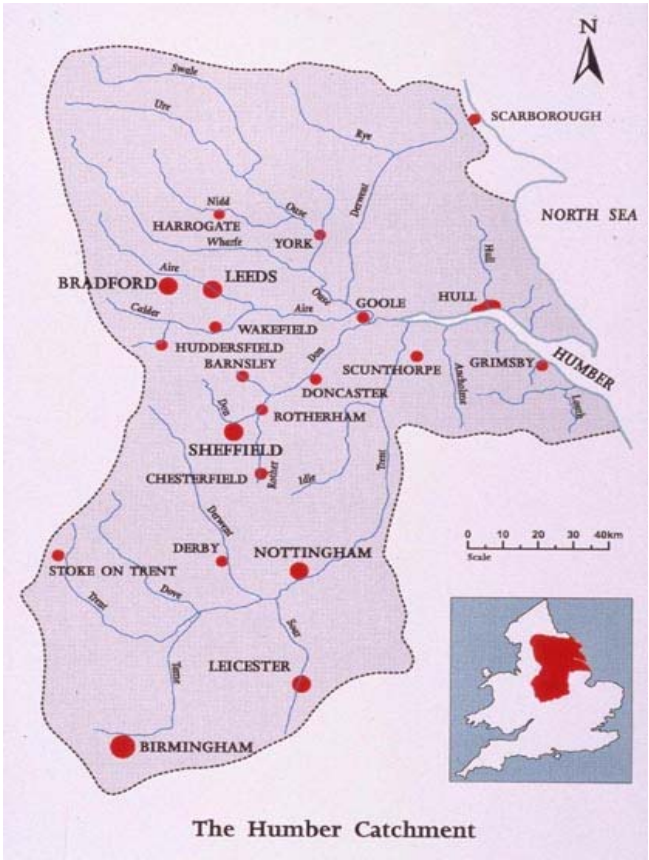
Measures

With respect to quality:

- Focus on solving problems in areas of high risk: remediation, natural attenuation, …
- e.g.: Spittelwasser could be important with regard to dioxins

With respect to quantity:

- Improvement of the tidal characteristics and the hydromorphological regime. Benefit for: Ecology, navigation, flood protection. Reduction of the amount of DM
- Realignment (more space) of the river
- Optimisation of dredging strategies in order to reduce the amounts of DM
- Beneficial reuse of dredged sediment (under isolation conditions)



The Humber Catchment

Humber

Humber is the best monitored river basin in the UK

Land-Ocean Interaction Study (LOIS) programme

Otherwise sediment flux is poorly monitored

One of 11 River Basin Districts in England and Wales

Largest in England: >26,000 km^2

Includes major industrial conurbations and intensive agriculture

Many rivers heavily modified

Issues – Humber:

- 16% at risk from sediment delivery
- 22% at risk from morphological change
- 34% probably at risk
- 58% at risk from phosphorus – much probably sediment related
- Industrial legacy

Issues – the estuary:

- Important port facilities – economic and social value
- High morphological change
- Need to dredge to maintain navigation – major existing sediment management activity
- 3% of sediment sourced from river basin
- Contaminants cause sediment management issues
- Contaminants from estuary and river basin

Interests

- Practitioners: Port Authority, flood protection, nature conservation, applied research experts (no direct WFD specialists)
  - Expertise predominantly estuarine areas
  - Whole systems approach – broad-scale
  - more general environmental benefits
- Looking for win-win solutions that hit multiple targets
  - WFD is just one of these
- Best practical sustainable environmental solutions

Challenges

- Desire not to end up with an EU generic approach to sediment management
  - in all parts of a basin
  - all basins
  - all countries
- Need to respect wide variation in sediment process within and between systems
- Development and delivery of guidance and frameworks that are not too restrictive and allow for variability

Challenges - 2

- Need for wide recognition that current “at risk” classification is screening level
  - should trigger:
    - Spatial discrimination
    - Further study of effects
    - Tests of significance of impacts
- Evidence based approach to link sediment state to impacts
- Institutional compartmentalisation, fluvial focus at high level
  - terminology “river basin management plans” cf. “catchment management plans”
  - integrated thinking about rivers and transitional waters

Challenges - 3

- Requirement to collate available data to identify knowledge gaps and enhance understanding
- Linking sediment management to environmental/climate change issues
  - Not compromising the ability of the system to respond
  - Adaptive management
- To ensure our concerns get through to decision and policy makers

„Round table report“

- Description of user interests
- Summary of problems and challenges
- Expectations, possible measures
- Methods of resolutions
- Discussion points
- Conclusions
- General recommendations
- Finished: end of January 2007

Target groups

- River Basin Managers
- Key players and users
- European Commission for the further WFD implementation process

Conclusions

- **Sediment is an issue in all of the 4 river basins (and in Rhine)**
- **Each river basin has specific characteristics; therefore sediment management will differ**
- **Estuaries are different from rivers; too much 'fluvial' thinking so far. Differences expected for e.g.:**
  - Time scales
  - Effectiveness of measures
  - More close linking of sediment management to environmental/climate change issues

Conclusions (2)

- **Integration of requirements of different directives is difficult for river basin managers and users**
  - **WFD**
  - **Birds & Habitats Directive**
  - **Marine Strategy**
  - **Soil Strategy**
  - **Environmental Liability Directive**

Discussion points

- **Sediment EQS values should be regarded as high level screening values:**
  - Start of diagnostics (tiered approaches)
  - Use different lines of evidence (and link sediment state to impacts)
  - For proper measures, a good understanding of the system is necessary
  - Role of EQS is different in upstream parts from role in downstream parts (estuaries)
  - EQS may not be appropriate for sediments in highly variable situations where measurable state-impact links are not well understood
- **EU Policies may create conflicting ambitions: DG-Environment, DG-Transport, DG-Health**

Recommendations

- Good ecological status requires proper attention to sediment issues
- Message to all key players: justify not considering sediment management (quantity/quality issues) in RBMP
- Be aware of natural variation
- Be aware of differences between catchments
- Current “at risk” classification requires further spatial definition and linkage of risk to impact
- Those involved in transitional water management need better engagement with those involved with river management (and vice versa)

Recommendations (2)

- Requirement to collate available data to identify knowledge gaps and enhance understanding
- EU should not only support problem identification, but also problem solving processes

THANK YOU
FOR
YOUR
ATTENTION