An overview over the work of SedNet - Working Group 5:
Risk Management and Communication

Importance and Implications of Risk Perspectives
and Communication in Sediment Management

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Hamburg, Germany
My wish list: 2002

A highly diverse WG

creative minds

unconventional thinking

commitment to the aim of the WG
and what it became .....
The Objective of Risk Management

to reduce risk posed by contaminated sediments to humans and ecological receptors to a level, deemed tolerable by society and to control and monitor sediment quality and ensure public communication with the final aim of complying with international regulations
Risk management has to address different aspects of risk

Scientific risk

~ “objective”

= magnitude of hazard * probability of exposure

Economic risk

too high expenditures necessary

loss of employment

Personal risk

mentioning of risks

Limited access to information

highly complex information

confidence in experts / inst.

personal responsibility

understandable communication
There is not just one or THE RISK along a river basin

If only one kind of risk is addressed, the result will create controversies.

If only one site is managed independently, risks will be created at other sites.

Pursuit of single interests creates conflicts and controversies.
WHY TO DO A RISK MANAGEMENT

.. to find a way to efficiently invest economic resources in order to **counterbalance** the different interests (and risks) along a river basin for a long time.

FROM **BASIN** TO **LOCAL** SCALE
This objective can only be achieved, if......

- the interests, objectives and risk perceptions along a river basin are known (the “human factor”) → DPSIR Approach
- the mass flow of contaminants and particles (quantitative and qualitative) within a river basin is understood (Conceptual Basin Model) → Sabine Apitz
- the risks are quantified and sites are prioritized according to their potential impacts on other up- and downstream areas
What are the interests and where are they focused?

DPSIR-Approach

DRIVERS

- Meeting regulatory criteria (national and international)
- Maintaining economic viability
- Ensuring Environmental Quality and Nature Development
- Securing Quality of Human Life

RESPONSES

- Meeting regulatory criteria (national and international)
- Maintaining economic viability
- Ensuring Environmental Quality and Nature Development
- Securing Quality of Human Life

Management Options
- Site-specific
- River Basin Scale

Indicators of Risk

RISKS and IMPACTS

Indicators of Risk
### Examples of “Ensuring environmental quality” / Maintaining economic viability

<table>
<thead>
<tr>
<th>Example drivers</th>
<th>Risk and impacts involved</th>
<th>Indicator of risk</th>
<th>Management option</th>
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<td>Ecological function</td>
<td>Loss of species&lt;br&gt;Degradation of wat. qual.</td>
<td>Change in biodiversity&lt;br&gt;Ecotox. effects / biomarkers&lt;br&gt;Contaminant load</td>
<td>Change in migrating fish-species</td>
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<td>Dredged material disposal</td>
<td>High cost / volume&lt;br&gt;limitations of disposal options&lt;br&gt;Loss of resources</td>
<td>Storage capacity&lt;br&gt;Disposal costs&lt;br&gt;Failure to comply with regulatory requirements</td>
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Prioritization of sites according to risks in the basin

Our approach addresses

- Location along the up – to downstream gradient
- (Hydrodynamic) energy
- Quantity
- Quality

It puts one site and its hazard in perspective to the other sites in the river basin
Method 1 - Score ordination

- Variables essential to the studied phenomenon are selected and ranked according to their relative importance
- Class boundaries are set for each variable

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<th>Criterion 2</th>
<th>Combination</th>
<th>Rank</th>
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<td>2 (medium)</td>
<td>1-2</td>
<td>2</td>
</tr>
<tr>
<td>1 (high)</td>
<td>3 (low)</td>
<td>1-3</td>
<td>3</td>
</tr>
<tr>
<td>2 (medium)</td>
<td>1 (high)</td>
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Babut et al., presentation SETAC 2004
Method 2 - Fuzzy logic

- Allows to handle uncertainty or “vague” data or rules
- And to combine heterogeneous data

Babut et al., presentation SETAC 2004
Prioritization of sites

Those sites are prioritized, where money is best invested with the highest positive impact on the whole river system.

A:
- Moderate contamination
- High upstream
-Large area contaminated
- **High sediment-dynamic**

B:
- High contamination
- Middle of the river basin
- Moderately sized area
- **Low sediment dynamic**

Risk(A) > Risk(B)
Solutions have to be implemented on site-specific scale

This requires site specific risk assessment of sediments

- differentiation of strategies: remediation – dredged material
- need to address HHRA (biomagnification and because of public concern)
- tiered approach comprising chemical, ecotoxicological and biological criteria
- Integrated risk evaluation

It requires to address economical and social issues

and the public risk perception towards planned management activities
SITE-SPECIFIC RISK MANAGEMENT

HAS TO ADDRESS PUBLIC PERCEPTION

There is a need for:
- Individual treatment
- Trust building
- Early communication
FROM BASIN TO LOCAL SCALE

....needs a river-basin specific discussion and decision forum!

This is a political process!

We hope to have developed and added

instruments and concepts

that will help to realize

a sustainable risk management

on basin scale in future!
Thanks for your attention

The Core Group of WG5