

An aerial photograph of a river landscape. A multi-lane bridge crosses a wide river. The river has a turbulent, white-water section just downstream from the bridge. The surrounding area includes green fields, some yellow rapeseed fields, and a small village with houses and trees. In the bottom left, there is a blue-tinted inset image showing a close-up of water with white foam and sediment.

Sed
Net

Effective river basin management needs to include sediment

European water policy objectives will only be achieved by also integrating sediment in River Basin Management Planning. Underpinned by the work of SedNet, the Elbe provides now for the first time an example on how to integrate sediment. SedNet is delighted with this milestone and is happy to share its experience with other European river basins.

Sediment

Like water, sediment is a cross-cutting issue, with links to - and possible consequences for - many different sectors, regulatory interests and management requirements. Sediment moves from the mountains to the sea and from fresh water to marine environments thus passing cultural, political, and geographical borders.

Specific challenges

Good water status can only be reached with a balanced sediment regime and good sediment quality. But hydromorphological modifications mainly due to navigation, hydropower or flood defence, and contamination by point and diffuse sources, are frequently cited in River Basin Management Plans across Europe as the two most important reasons for water bodies not achieving good status or potential as demanded by the EU Water Framework Directive.

Dredging is necessary to maintain and develop ports and harbours, navigable waterways, reservoirs for drinking water or energy production, etc. Dredging and dredged material disposal along with other types of infrastructure development may affect the environment, but measures can be taken to mitigate the impacts of these activities and to enhance status.

A disrupted sediment regime can cause river morphology degradation, in turn exacerbating flood risk. Moreover, flood plain aggradation in combination with riverbed degradation can contribute to the drying out of floodplain areas and hence to a reduction in their flood retention capacity. Ensuring an appropriate sediment supply can therefore also support the objectives of the EU Floods Directive.

The relevance of sediments for achieving fundamental management goals in river basins is obvious. However, the perceived complexity often hinders the full integration of sediment issues into river basin management.

Sediment management concept to address challenges

Since the start of EU integrated water policy implementation it has been SedNet's aim to incorporate sediment issues and knowledge into EU strategies to support the achievement of good environmental status or potential, and to develop new tools for sediment management. To this end, one of the actions taken by SedNet is the organisation of Round Table meetings to bring together European experiences in integrating sediment in river basin management.

Driven by the desire to put together a sediment management concept for the Danube and by the availability of the Elbe concept, the 3rd SedNet Round Table took place in November 2016 in Budapest. This Round Table was co-organised by the International Commission for the Protection of the Elbe River (<http://www.ikse-mkol.org/en/>) and the International Commission for the Protection of the Danube River (<https://www.icpdr.org/main/>).

In the Elbe, for the first time a comprehensive sediment management concept has been developed in support of management planning in a large international river basin. A main conclusion of the Budapest



Round Table was that the Elbe provides an inspiring example on how to integrate sediment in river basin management. The concept is underpinned by the work of SedNet and meets the following criteria:

- It is based on a coherent conceptual model at river basin scale that considers the various functions and uses of sediment, operates at different spatial locations within a river basin and operates at different time scales;
- It makes use of a holistic approach that takes into account all of the following: system and process understanding both in terms of sediment quality and sediment quantity; the integrated management of soil, water and sediment; upstream-downstream relationships; and supra-regional and transboundary collaboration;
- It uses approved mechanisms for elaborating plans and for the necessary early engagement with a wide range of stakeholders.

The main steps towards the Elbe sediment-management concept are: (1) to identify all those river basin management goals that are linked to sediment; (2) to evaluate the status of the system in terms of sediment quantity, sediment quality and hydromorphology, based on significant indicators; (3) to analyse the risks of insufficient sediment status for the attainment of the main objectives of the ICPEP; and finally (4) to make recommendations for river basin management planning. Recommendations are derived from all three perspectives and are prioritised according to specific sediment quantity, sediment quality or hydromorphology criteria as well as more general criteria. Among the latter most important are: (i) to deal with an issue at source rather than addressing a symptom; (ii) if the underlying cause (source) no longer exists, to take remedial action as close to the source as possible (“sweeping the stairs from the top down”); and (iii) to favour recommendations from one perspective, e.g. sediment quantity, that also have a positive effect on one or both of the other two, i.e. sediment quality and hydromorphology.

What SedNet can offer

SedNet offers to support the integration of sediment in river basin management by sharing its experience in:

- Understanding sediment processes and behaviour at strategic and local levels;
- Developing and implementing good sediment management practice concepts;
- Developing and facilitating the practical implementation of good practice sediment management measures;
- Identifying and evaluating measures designed to ensure that new physical modifications and other new sustainable developments do not adversely affect the natural sediment regime.

About SedNet

Since 2002, SedNet has brought together experts from science, administration and industry. It interacts with various relevant networks in Europe that operate at a national or international level or that focus on specific fields (such as science, policy making, sediment management, industry, education). Further information on the specific activities organised by SedNet to bridge the gap from sediment science to policy making and practice, and *vice versa*, is provided in the annex and is also available at <http://sednet.org/>.

Contact:

SedNet Secretariat
Deltares
PO Box 85467
NL-3508 AL Utrecht

Phone: +31 651286087
Email: marjan.euser@deltares.nl
Internet: www.sednet.org



Annex: SedNet Science-Policy Interfacing (SPI) activities in brief:

SedNet has bridged and continues to bridge the gap from sediment science to policy making and practice and *vice versa* in several different ways.

Four scientific books have been published by SedNet in the Elsevier's 'Sustainable Management of Sediment Resources' mini-series:

- Volume 1 – Sediment Quality and Impact Assessment of Pollutants (2006);
- Volume 2 – Sediment and Dredged Material Treatment (2006);
- Volume 3 – Sediment Risk Management and Communication (2007);
- Volume 4 – Sediment Management at the River Basin Scale (2007).

SedNet has produced three position papers / policy briefs:

- Contaminated Sediments in European River Basins (2004);
- Moving Sediment Management Forward - The four SedNet key messages (2014);
- Effective river basin management needs to include sediment (2017).



SedNet organised three Round Table Discussions (2006, 2009 and 2016) on the state-of-inclusion of sediment in River Basin Management planning. Amongst other activities, discussions have been organised with River Basin Management Commissions representatives.

SedNet was a key-participant in the Water Framework Directive (WFD) Common Implementation Strategy (CIS) working group Analysis and Monitoring of Priority hazardous Substances (AMPS) and as such one of the principle authors of the AMPS guidance document. Furthermore, SedNet participated in the WFD CIS working group C (Chemicals) that drafted guidance on chemical monitoring of sediments and biota under the WFD. SedNet currently participates in action 5 of the EU biodiversity strategy i.e. the action 'Mapping and Assessment of Ecosystems and their Services' (MAES) and especially in the MAES soil pilot working group.

A practical training course on sustainable sediment management was organised in 2012 for the Sava in cooperation with, amongst others, the International Sava River Basin Commission and the four main Sava countries.

The international SedNet conference provides a biannual opportunity for sediment and water practitioners and managers, policy makers, port authorities and others to discuss evolving good practice and to share the latest scientific insights in sediment management.

E-newsletters are prepared 3 to 4 times a year and disseminated to sediment professionals with global outreach.

More information on these publications and activities is available at <http://sednet.org/>

14 June 2017