

SedNet Corner (Demand-driven, European Sediment Research Network)

Sediment Monitoring under the EU Water Framework Directive

Jos Brils

SedNet coordinator, TNO Environment, Energy and Process Innovation (TNO-MEP),
Department for Ecological Risk Studies, P.O. Box 17, 1780 AB Den Helder, The Netherlands
(i.m.brils@mep.tno.nl); www.SedNet.org)



This SedNet¹ corner briefly addresses sediment monitoring in relation to the EU Water Framework Directive (WFD) needs. It presents the viewpoint of the EU WFD Expert Group on Analysis and Monitoring of Priority Substances (AMPS), complemented, where indicated, by the viewpoints of SedNet. SedNet participates with AMPS and helped to draft a discussion document on this issue.

Introduction

The EU Water Framework Directive (WFD 2000) contains provisions that call for assessments of contaminated sediments. Firstly, Article 16(7) of the Directive states, "The Commission shall submit proposals for quality standards applicable to the concentrations of the priority substances in surface water, sediments or biota". If quality criteria were to be defined for sediment, then monitoring would be required to establish compliance with such criteria. Secondly, it is clear from the WFD that sediment monitoring can play a role when assessing impacts on environmental quality, while monitoring trends in pollutant levels and compliance with the WFD's no-deterioration objective (Annex V 2.4), and in any investigative monitoring of pollutants' fate and behaviour (Stronkhorst et al. 2004).

In order to address these requirements of the WFD, the working group on Analysis and Monitoring of Priority Substances (AMPS) has considered the technical implications of sediment monitoring. AMPS intends to summarise the key issues and give technical expert advice to the EC on analysis and monitoring aspects, in order to justify the choices made in the forthcoming proposal for a daughter Directive on priority substances. The document could provide: a) suggestions for drafting proposals on sediment monitoring for the daughter Directive and b) recommend areas of sediment assessment to be further developed in the near future, to yield annexes to legislation or a separate guidance document (Stronkhorst et al. 2004).

AMPS proposes the following **definition for sediment**: particulate material such as sand, silt, clay or organic matter that has been deposited on the bottom of a water body and is susceptible to being transported by water (Stronkhorst et al. 2004).

Importance of sediment to the WFD

The AMPS discussion document here directly follows the SedNet strategy paper (SedNet 2003). The strategy paper, in turn, was the basis for a recently prepared SedNet brochure entitled 'Sediment, a valuable resource that needs Europe's attention' (SedNet 2004). In brief: sediment is an essential, integral and dynamic part of our river basins. Sediment in our rivers is an important habitat as well as a main nutrient source for aquatic organisms. Sediment is also

used as farmland and as a source of minerals and materials. Stimulated by the WFD, the view on sediment is changing to the recognition of the key role that sediment plays naturally in the function of river systems. Sediment management should fit into the holistic view of the role of sediment in river basin systems. This means that trans-boundary management is needed for river systems that cross water bodies and national borders.

In the opinion of SedNet, the WFD, therefore, represents an enormous opportunity and stimulus to come up with guidance for sustainable sediment management. The current scope of the WFD does not yet specifically deal with this subject. Sustainable sediment management should eventually become an integrated part of the WFD. The requirements for a river basin-wide sediment concept will be even more challenging than the actual WFD (Förstner 2002).

Aim of sediment monitoring

The purpose of analysing the levels of priority substances in sediments under the WFD might be: a) to monitor the progressive reduction in the contamination of priority substances and phasing out of priority hazardous substances and b) to demonstrate conditions of 'no deterioration' in sediment quality. This is implicit in the need to ensure adequate provision of pollution prevention and control (Stronkhorst et al. 2004).

Four types of monitoring relate to the WFD: 1) **Risk assessment**, for instance by applying the sediment quality Triad (Chapman 1996) for an initial indication of the likely causes of a waterbody's poor ecological status; 2) **Trend monitoring**, providing an indication of increases or decreases in concentrations of contaminants over time; 3) **Spatial monitoring**, providing an indication of the status of contamination over an area and 4) **Compliance monitoring**, for checking if pre-set sediment Environmental Quality Standards (EQS) are met. The latter, however, is not yet appropriate because of the lack of valid sediment EQSs and the complexity of deriving such criteria in a European context. A further obstacle is the anticipated high costs of obtaining full spatial coverage (Stronkhorst et al. 2004).

Furthermore, sediments have an impact on ecological quality because of their quality, or their quantity, or both. Therefore, sediment monitoring programmes should also address the basic physicochemical properties of sediments (grain size distribution, organic carbon content, etc.) as well as the geomorphological processes within each river system, including those operating in floodplains, wetlands and the coastal zone. The physicochemical quality of sediments is featured in the definition of good and moderate ecological status in rivers and lakes

¹ The European Sediment Research Network SedNet is a network for environmentally, socially and economically viable practices of sediment management at the river-basin scale. The SedNet activities are financially supported as a Thematic Network project by the European Commission (EC FP5, contract No. EVK1-CT-2001-2002). For more information please visit www.SedNet.org or contact the author of this SedNet corner.

(Annex V 1.2). However, as this issue is not related to priority substances, it is outside the scope of the discussion document (Stronkhorst et al. 2004).

How to continue?

The AMPS discussion document indicates that there is a clear need to develop diagnostic and technical guidance for sediment monitoring. Such guidance should be made available in the year 2006 in order to support Member States in their effort to implement the WFD. First of all, there is the need to develop new monitoring programmes under the WFD. Secondly, analyses are under way to identify the necessary measures to meet the good ecological status and water quality standards (Stronkhorst et al. 2004).

Finally, in the discussion document, SedNet suggests coming up with a more detailed proposal on how to derive Technical Guidance for sediment monitoring related to the WFD needs. The proposal could be worked out in close consultation with the EC DG Environment, the AMPS sediment monitoring drafting group and other experts (scientists and stakeholders) involved in SedNet.

PS: for your agenda

November 25th and 26th, 2004: 3rd SedNet conference in Venice, Italy. This 3rd and final SedNet conference under the EC-project duration will again be held at the SedNet homebase at the island of San Servolo in Venice, Italy. The preliminary title/scope of the conference is: **The future of sediment management in Europe and the**

role of SedNet. Besides presenting the outcome of the 3 year EC project, that will come to an end by 31 December 2004, 'opinion-leaders' will be invited to mediate their future perspective on sediment management and the role of SedNet therein.

References

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- WFD (2000): Water Framework Directive (WFD) Directive 2000/60/EC, L327/1, Official Journal of the EC

Calendar of Events

July 25th–30th, 2004,

7th INTECOL International Wetlands Conference, Utrecht University, Utrecht, The Netherlands (www.bio.uu.nl/intecol)

August 17th–20th, 2004,

6th International Symposium on Sediment Quality Assessment – Watershed – Sediment management, from source to sink (www.ua.ac.be/ecobe)

August 20–28, 2004,

32nd International Geological Congress, Florence, Italy (www.32igc.org/home.htm)

August 29th–September 1st, 2004,

9th DCE/FECS Conference on Chemistry and the Environment 'Behaviour of Chemicals in the Environment' and 2nd SFC Meeting on Environmental Chemistry Behaviour of Chemicals in the Environment, Bordeaux, France. Information at: membres.lycos.fr/fecsdc9 or mail to: dce9@lptc.u-bordeaux1.fr (<http://www.lptc.u-bordeaux.fr/DCE9/>)

August 30th–September 2nd, 2004,

A short course on 'Remediation and handling of contaminated sediments' will be held in Delft, The Netherlands, organised by the International Hydraulic Institute (IHE)-UNESCO in cooperation with the Aquatic Sediment Expert Centre of the Ministry of Transport (AKWA), Public Works and Water Management. This course is intended for students and experts from developing countries and other emerging countries like those in Eastern Europe. In addition to the Dutch expertise, knowledge and experience from other European countries are incorporated. For further information and registration contact: Peter Hollanders (p.hollanders@unesco-ihe.org)

September 27th–October 1st, 2004,

Wodcon XVII (17th World Dredging Congress), CCH – Congress Centrum Hamburg, Hamburg, Germany (www.woda.org)

October 18th–21st, 2004,

The 20th Annual International Conference on Soils, Sediments & Water, University of Massachusetts at Amherst, USA (www.umasssoils.com/papers.htm)

October 18th–21st, 2004,

Ninth International Symposium on River Sedimentation (9TH ISRS), Dam Site of the Three Gorges Project near Yichang City, Yichang, China (www.irtces.org/issahu/9ISRS.htm)

January 23rd–26th, 2005,

First International Conference on Environmental Science and Technology, New Orleans, Louisiana, USA. The conference will provide a multidisciplinary platform for environmental scientists, engineers and management professionals to discuss the latest developments in environmental research and applications. The deadline for submitting abstracts is May 31, 2004. Email inquiries to conference@AASci.org (www.AASci.org/conference)

January 24th–27th, 2005,

3rd International Conference on the Remediation of Contaminated Sediments, New Orleans, Louisiana, USA. The theme of the conference will be 'Finding Achievable Risk Reduction Solutions' (www.battelle.org/environment/er/conferences/sedimentscon/default.stm)

April 11th–13th, 2005,

Third International Conference on Water Resources Management, Tivoli Almansor Hotel in the Algarve, Portugal (www.wessex.ac.uk/conferences/2005/waterresources2005/cfp.html)