



European **S**ediment Research **N**etwork

SedNet



**Sediment,
a valuable resource
that needs
Europe's attention**





Sediment, a valuable resource that needs Europe's attention

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. Several European policies provide a basis to protect and manage this valuable natural resource. However, these policies only fragmentarily and indirectly address sediment. Effective protection and proper management deserves a more focused approach.

What is sediment?

Sediment is an essential, integral and dynamic part of our river basins. Sediment is derived from the weathering and erosion of minerals, organic material and soils in upstream areas and from the erosion of river banks. As surface water flow rates decline in lowland areas, transported sediment settles along the river banks and on the bed of the river, i.e. sedimentation.

This also occurs on floodplains during flooding, and in reservoirs and lakes. At the end of most rivers, the majority of the remaining sediment is deposited within the estuary and on the seabed of the coastal zone. A natural river tends to be in a state of dynamic equilibrium. Small variations in the flow of water and sediment are autonomously regulated. Settled sediment may re-suspend and subsequently settle again.





Why is it valuable?

Sediment forms a variety of habitats and environments. Many aquatic species live in the sediment: it is their house. It also provides an important source of nutrients for these organisms. Sediment dynamics and gradients (high-low and wet-dry) form favourable conditions for a varied environment (biodiversity), from the origin of the river until the coastal zone. A healthy river needs sediment: it is a source of life. Sediment is also a beneficial, socio-economic resource. For centuries mankind has recognised and utilised sediments in river systems as farmland and as a source of minerals and materials.

Why take care of it?

Sediment **quantity** has been managed for centuries, mostly by dredging. This was, and still is, very much needed in order to keep waterways, that tend to silt up, open to the flow of water. This ensures enough water (depth) for shipping and for drinking and irrigation purposes and it aids in flood prevention. However, the natural hydrodynamic conditions of many waterways have been altered: directly by dykes, dams, seawalls, and artificial drainage, and indirectly by changes in land cover and use, such as deforestation and urbanisation. These changes have resulted in the accumulation of sediment at unwanted places. The removal of sediments from locks, floodplains, reservoirs, harbours, navigation channels and river stretches is a high capital cost for authorities and agencies responsible for their maintenance and water quality. Since the beginning of the industrial revolution, hazardous chemicals were emitted to our surface waters. Lots of these chemicals do not readily dissolve in water but rather stick to the sediment. Therefore, sediment quality rapidly deteriorated at several places also because a lot of chemicals do not readily break down in sediment. Thus history of mankind is reflected in the sediments. This introduced the need for a new type of management: sediment **quality** management.

Why is it a concern of Europe?

Sediment issues occur on a number of temporal and spatial scales (geological cycle, catchment area, river foreland, and polder) and do not pay attention to political or administrative boundaries. The responsibilities for sediment management are often scattered and, due to its trans-boundary nature, no single stakeholder or country feels responsible for solving sediment management problems at the river-basin scale.

What are the challenges?

In the next few decades, Europe faces the large scale remediation of historically contaminated areas of sedimentation in many river basins. Whereas water quality at most places is improving, the legacy of the past industrial era is still present in the sediments hidden at the bottom of rivers and estuaries and on the floodplains of many early industrialised European river basins like the Aire, Elbe and Rhine. One of the increasingly important challenges in European river basin management is the need to develop environmentally and socio-economically viable strategies and solutions for this environmental legacy. Another challenge is to further reduce water, and thus sediment, contamination from point sources and especially from diffuse sources. This is the best solution in the long-term, environmentally as well as socio-economically.

What can Europe do?

At the level of the EU, sediment management is addressed fragmentarily and it is only covered by EU policies and directives for very specific issues. Effective protection and management of our sediment resources needs a more focussed approach. The EU Water Framework Directive (WFD) aims to harmonise water legislation in EU countries and focuses on the management of water at the river-basin scale. Thus it gives the best possibility for integration of a more direct and less fragmented focus on sediment management.

Stimulated by the WFD, the view on sediment is changing to the recognition of the key role that sediment plays naturally in the functioning of river systems. Sediment management should fit into the holistic view of the role of sediment in river basin systems.

This means that for river systems that cross water bodies and national borders, trans-boundary management is needed. 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 cover this subject in a clear way. Sustainable sediment management should eventually become an integrated part of the WFD.



European **S**ediment Research **N**etwork

SedNet



This document is prepared in May 2004 by the contractors and Stakeholders Panel of the European Sediment Research Network SedNet. A full list of the people involved in the preparation is available at our website at www.sednet.org/authors.asp

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-2001-20002).

To date SedNet reaches more than 900 persons involved or interested in sediment management.

People originate from more than 60 countries (world-wide) and more than 550 organizations, from science (ca. 80%) to stakeholders (ca. 20%).

For more information please visit our website or contact the SedNet coordinator, Jos Brils,
e-mail: j.m.brils@mep.tno.nl

European **S**ediment Research **N**etwork

SedNet



info:

www.sednet.org

SedNet Coordinator j.m.brils@mep.tno.nl

SedNet Home Base / Conference

emanuele.zanotto@port.venice.it



Printed on paper manufactured
with seaweed from the Venice Lagoon.