continued from page 268 – DOI: <http://dx.doi.org/10.1065/jss2006.11.194.2>

JSS Subject Area 'Sediments' – Editor-in-Chief: Ulrich Förstner (u.foerstner@tu-harburg.de)	
Section 1: Sediment quality and impact assessment	
Responsible for	Subject Editors
invertebrates (sediment toxicity assessment; microorganisms)	Ahlf, Wolfgang , Institute of Environmental Technology and Energy Economics, Hamburg University of Technology, 21073 Hamburg, Germany, ahlf@tu-harburg.de (to be introduced in No. 1, 2007)
analysis and modelling of sediment-water interaction; spectroscopic speciation of sediment-bound contaminants	Kersten, Michael , Institut für Geowissenschaften, Johannes Gutenberg-Universität, 55099 Mainz, Germany, kersten@uni-mainz.de (to be introduced in No. 1, 2007)
evaluation and risk assessment of contaminated sediments	Knacker, Thomas , ECT Ökotoxikologie GmbH, 65439 Flörsheim, Germany, th-knacker@ect.de
transportation, storage and transfer of fine sediments and associated nutrients / contaminants	Petticrew, Ellen , School of Geography, University of Plymouth, Plymouth, Devon PL4 8AA, UK ellen.petticrew@plymouth.ac.uk (to be introduced in No. 1, 2007)
Advisors	
water chemistry	Frimmel, Fritz , Engler-Bunte-Institut, Lehrstuhl für Wasserchemie, Universität Karlsruhe, 76131 Karlsruhe, Germany, fritz.frimmel@ebi-wasser.uni-karlsruhe.de
sediment biotests	Neumann-Hensel, Helga , Labor Fintelmann & Dr. Meyer, 22671 Hamburg, Germany, hensel@inlabco.com (to be introduced in No. 1, 2007)
organic geochemistry	Schwarzbauer, Jan , Lehrstuhl für Geologie, Geochemie und Lagerstätten des Erdöls und der Kohle, RWTH Aachen, 52084 Aachen, Germany, schwarzbauer@lek.rwth-aachen.de
Section 2: Sediment risk management and communication	
Responsible for	Subject Editors
risk management and communication	Babut, Marc , CEMAGREF, Freshwater Ecosystems Biology Res. Unit, 69336 Lyon Cedex 9, France, marc.babut@cemagref.fr
risk assessment; sediment management; integrated assessment; coastal / marine environments	Heise, Susanne , Beratungszentrum für Integriertes Sedimentmanagement (BIS), Technische Universität Hamburg Harburg, 21073 Hamburg, Germany, s.heise@tu-harburg.de (to be introduced in No. 1, 2007)
Advisors	
ecotoxicological assessment and monitoring of contaminated sediment; effluents; surface water and soil	Brils, Jos , TNO Built Environment and Geosciences, Business Unit Groundwater and Soil, 3584 CB Utrecht, The Netherlands, jos.brils@tno.nl (to be introduced in No. 1, 2007)
Section 3: Sediment management at the river basin scale	
Responsible for	Subject Editors
vertebrates (sediment toxicity assessment, sediment transport [biological])	Hollert, Henner , Department of Zoology, Aquatic Toxicology, University of Heidelberg, 69120 Heidelberg, Germany, Henner.Hollert@urz.uni-heidelberg.de
soil erosion and fine sediment redistribution in river basins; sediment management in river catchments	Owens, Philip , National Soil Resources Institute, Cranfield University, North Wyke Research Station, Okehampton, Devon EX20 2SB, UK, philip.owens@bbsrc.ac.uk
sediment hydraulics and modelling; combination of sediment stability and pollutant mobility data	Westrich, Bernhard , Institut für Wasserbau, University of Stuttgart, 70550 Stuttgart, Germany bernhard.westrich@iws.uni-stuttgart.de (to be introduced in No. 1, 2007)
Advisors	
qualitative hydrology	Heininger, Peter , Bundesanstalt für Gewässerkunde, 56002 Koblenz, Germany, heininger@bafg.de (to be introduced in No. 1, 2007)
heavy metals from mine wastes and industrial effluents on river basin scale	Helios-Rybicka, Edeltrauda , University of Mining and Metallurgy, 30 - 059 Krakow, Poland, helios@geol.agh.edu.pl (to be introduced in No. 1, 2007)
sediment management at the river basin scale	Reincke, Heinrich , Senatskanzlei-Planungsstab, Freie und Hansestadt Hamburg, 20354 Hamburg, Germany, Heinrich.Reincke@sk.hamburg.de (to be introduced in No. 1, 2007)
Section 4: Sediment and dredged material treatment	
Responsible for	Subject Editors
sediment geochemistry, dredged material treatment and disposal	Hamer, Kay , Fachbereich 5 Geowissenschaften, Universität Bremen, 28359 Bremen, Germany, khamer@uni-bremen.de
aquatic ecology and ecotoxicology; contaminated sediment assessment and remediation	Zarull, Michael , National Water Research Institute, Environment Canada, Aquatic Ecosystem Management Research, Burlington ON L7R 4A6, USA, Michael.Zarull@ec.gc.ca (to be introduced in No. 1, 2007)
Advisors	
habitats; microalgae; toxicity; erosion risk assessment; biogenic mediation of sediment stability	Gerbersdorf, Sabine , Gatty Marine Laboratory, St Andrews, Fife KY16 8LB, Scotland, UK, sug@st-andrews.ac.uk (to be introduced in No. 1, 2007)

JSS Subject Area 'Sediments' – Editor-in-Chief: Ulrich Förstner (u.foerstner@tu-harburg.de)		
Section 1: Sediment quality and impact assessment		
Responsible for: Evaluation and risk assessment of contaminated sediments Challenges: Improvement of environmental risk assessment for biologically active substances, e.g. biocides, pharmaceuticals, endocrine disrupting chemicals and personal care products (Liebig et al. 2006). Integration of ecotoxicologically meaningful data into the process of establishing quality standards for environmental compartments.	Subject Editors Dr. Thomas Knacker ECT Ökotoxikologie GmbH, Böttgerstr. 2–14, 65439 Flörsheim, Germany T: +49-(0)6145/9564-11 th-knacker@ect.de http://www.ect.de

Dr. Thomas Knacker is Managing Director of the company ECT Ökotoxikologie GmbH in Flörsheim, Germany, since 1993. He qualified as biologist from the University of Frankfurt am Main, Germany, in 1981 and holds a Ph.D. in plant physiology, biochemistry and microbiology. In 1982 he was granted a postdoctoral fellowship and studied plant lipids at the University of Wales in Cardiff, U.K. – At ECT he is head of the testing facility according to GLP, manages and coordinates national and European research projects concerning effects and fate of chemicals in the environment. More recently he has established a group of risk assessors at ECT which conducts and evaluates environmental risk assessments according to various legislations on behalf of chemical industries and competent authorities (Knacker et al. 2005). – He is member of the Society of Environmental Toxicology and Chemistry (SETAC) and was elected as council member of

the SETAC-German Language Branch for five years. He is member of national and OECD expert groups providing advice on ecotoxicological test methods and testing strategies (Römbke and Knacker 2003).

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- Liebig M, Moltmann J, **Knacker T** (2006): Evaluation of Measured and Predicted Environmental Concentrations of Selected Human Pharmaceuticals and Personal Care Products. *Environ Sci Pollut Res* 13 (2) 110–119
- Römbke J, **Knacker T** (2003): Standardisation of Terrestrial Ecotoxicological Effect Methods: An example of successful international co-operation. *J Soils Sediments* 3 (4) 237–238

Section 1: Sediment quality and impact assessment		
Responsible for: Water chemistry Challenges 1. Molecular scale transformation in soil as a bioreactor 2. Emerging xenobiotics (pharmaceuticals, perfluorinated acids, etc.) 3. Benefit / risk relation of chemical and physicochemical consumer products 4. Interaction with aquatic phase (fringe zone) 5. Ground water protection (Fava et al. 2006, Geets et al. 2006)	Advisors Prof. Dr. Fritz H. Frimmel Chair of Water Chemistry, University of Karlsruhe, Engler-Bunte-Institut, Engler-Bunte-Ring 1, 76128 Karlsruhe, Germany T.: +49-(0)721/608-2580; F: +49-(0)721/699154 fritz.frimmel@ciw.uni-karlsruhe.de http://www.wasserchemie.uni-karlsruhe.de/index.en.html

Main Research Subjects

- Water treatment (Haberl 2003)
- Quality of natural waters
- Remediation (Garelick et al. 2005),
- Refractory organic substances
- Interfacial phenomena in aquatic systems and aqueous phases

More than 493 publications and ca. 380 lectures.

Editor/Coeditor of the following journals:

- Acta hydrochimica et hydrobiologica (Editor-in-Chief)
- gwf Wasser/Abwasser (Editor-in-Chief)
- Umweltwissenschaften und Schadstoff-Forschung (Ed. Board)
- J Soils Sediments (Advisor)
- Int J Pure and Applied Chemistry (Ed. Board)

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¹ **Review Series:** Water Chemistry - Science and Technology (Ed. Fritz H. Frimmel)

² **Part I:** Integrated water quality management: River basin approach*

³ **Review Series:** Water Chemistry - Science and Technology (Ed. Fritz H. Frimmel)*

⁴ **Part III:** Therapy of aquatic systems when they need help*

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⁵ **Part IV:** Fitness for aquatic systems*

- Obst U (**Frimmel FH**, ed), (2003): Strategies of Maintaining the Natural Purification Potential of Rivers and Lakes. *Environ Sci Pollut Res* 10 (4) 251–255⁶
- Schindelin AJ, **Frimmel FH** (2000): Nitrate and Natural Organic Matter in Aqueous Solutions Irradiated by Simulated Sunlight. *Environ Sci Pollut Res* 7 (4) 205–210
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⁶ **Part III:** Therapy of aquatic systems when they need help*

⁷ **Part II:** Diagnosis of water bodies needs reliable and powerful methods*

⁸ **Part II:** Diagnosis of water bodies needs reliable and powerful methods*

Section 1: Sediment quality and impact assessment

Responsible for: Organic geochemistry	Advisors	
<p>Challenges: The field of Organic Geochemistry provides big challenges, in particular for sediments and soils. Biological, chemical and geological processes are important factors affecting the nature and behaviour of these compartments. With respect to natural conditions, the biogeochemical approach can provide important insights into the mechanisms of incorporation, modification and stabilisation of soil and sediment organic matter. Similar approaches with respect to anthropogenically affected soils and sediments will reveal new fundamental insights into the behaviour of xenobiotics and related man-made chemicals under natural conditions. In particular, the tendency to consider a more system-orientated approach and to abandon a dominantly substances-related strategy for scientific investigations will reveal an enhanced understanding of our anthropogenically influenced environment and the resulting effects on biota and ecosystems in the future.</p>	<p>PD Dr. Jan Schwarzbauer Laboratory for organic-geochemical Analysis Institute of Geology and Geochemistry of Petroleum and Coal RWTH Aachen University Lochnerstr. 4-20, 52056 Aachen, Germany T: +49 241 8095750; F: +49 241 80695750 schwarzbauer@lek.rwth-aachen.de</p> <p>Editor-in-Chief: <i>Environmental Chemistry Letters</i> Assoc. Editor (Geochemistry): <i>Environmental Geology</i> Advisor (Org. Geochemistry): <i>Journal of Soils and Sediments</i></p>

Research topics:

- Organic pollutants in riverine water and sediment: origin, fate and distribution (Antić et al. 2006)
- Anthropogenic input of organic contaminants in riverine and estuarine water and sediment
- Structure elucidation and characterization of unknown contaminants
- Organic-geochemical signature of ground- and surface water, including detailed molecular characterization of anthropogenic sources of contamination (sewage, seep water of waste deposits, waste water of mining areas, industrial effluents...) (Jovancicevic et al. 2005)
- Organic-geochemical characterization of bound residues in macromolecular organic matter of riverine systems

- Compound specific isotope analyses (CSIA) of organic pollutants (Schwarzbauer and Littke 2004)
- Geochronology of organic pollution in riverine systems
- Analysis of macromolecular contaminants in soils and sediments

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Section 2: Sediment risk management and communication

Responsible for: Risk management and communication	Subject Editors	
<p>Challenges</p> <p>Research:</p> <ul style="list-style-type: none"> sediment Environmental Quality Standards (or guidelines) (Cornelis et al. 2006, Vighi et al. 2006, den Besten et al. 2003) scaling – from global (catchment) to local scale (Crosa et al. 2006) integration of various kinds of stress in risk assessment (e.g. quality and quantity, erosion and contamination) (Abu-Zreig 2006) <p>Management (which may be research topics for social sciences):</p> <ul style="list-style-type: none"> risk characterisation and communication (Heise et al. 2004) risk perception (van der Meulen et al. 2006) stakeholder involvement (i.e. whereas their participation in management processes is more and more acknowledged, the modalities, if not the goal, are not always that clear) (Gerrits and Edelenbos 2004) <p>Policy: for European authorities, acknowledge sediments as a priority, if the WFD goals would not be achieved</p>	<p>Dr. Marc Babut CEMAGREF, Freshwater Ecosystems Biology Res. Unit, 69336 Lyon Cedex 9, France marc.babut@cemagref.fr</p>

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Section 3: Sediment management at the river basin scale

Responsible for:	Subject Editors	
<p>Vertebrates (sediment toxicity assessment, sediment transport [biological])</p> <p>Areas of interest</p> <ul style="list-style-type: none"> • aquatic toxicology • ecology • ecotoxicology • environmental pollution • sediment toxicity • soil toxicity • statistics • zoology 	<p>Dr. Henner Hollert Department of Zoology, University of Heidelberg, Aquatic Toxicology, Im Neuenheimer Feld 230, 69120 Heidelberg, Germany T: 49 6221 54-5650 F: 49 6221 54-6162 Henner.Hollert@urz.uni-heidelberg.de http://www.aquatox.org/</p>

Challenges

by Henner Hollert

I see the major aim of this sub-category in 1. the impact of particle-bound pollutants at the river basin scale on biota and communities (Brack et al. 2005, Keiter et al. 2006, Rastall et al. 2004), and 2. the development of weight-of-evidence (WOE) strategies such as the triad approach or more sophisticated WOE frameworks (Chapman & Hollert 2006).

In this context, there has been increasing interest in the development/application of additional lines of evidence to fill the gaps in current WOE approaches. These include:

- Sediment contact assays (Feiler et al. 2005, Heise & Ahlf 2005, Hollert et al. 2003, Weber et al. 2006),
- mechanism-specific endpoints in vertebrate-based test systems such as genotoxicity, endocrine disruption, immunotoxicity and dioxin-like toxicity (Fossi et al. 2006, Hilscherova et al. 2000, Hollert et al. 2005a, Klee et al. 2004, Gustavsson et al. 2004, Kosmehl et al. 2004, Olsman et al. 2006, Sanchez et al. 2005, Seiler et al. 2006),
- effect-directed analyses (EDA) of particle bound pollutants to identify key pollutants (Biselli et al. 2005, Brack et al. 2006, Kammann et al. 2005a, Rastall et al. 2006), and
- in-situ studies (Geets et al. 2005, Hollert et al. 2004, Kammann et al. 2005b, Kostanjsek et al. 2005, Lachmund et al. 2003, Rakocevic-Nedovic and Hollert 2005).

In addition to these effect-related aspects, there has been an increasing awareness of the potential role of sediment and pollutant mobility in the river basin perspective with regard to toxicity-related issues (Ahlf et al. 2002, Förstner et al.

2004, Förstner & Westrich 2005, Hollert et al. 2005b, Owens 2005, Scrimshaw et al. 2006, Sigua et al. 2004a, 2004b, Westrich & Förstner 2005, Zehl & Einax 2005). Consequently, there is the need to comprehensively assess ecotoxicological risks associated with contaminated sediments after possible mobilization (for example by flood events, see Maier et al. 2006).

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Section 3: Sediment management at the river basin scale

Responsible for: <ul style="list-style-type: none"> • soil erosion and fine sediment redistribution in river basins • sediment management in river catchments Areas of interest <ul style="list-style-type: none"> • environmental radionuclides • fine-grained sediment • phosphorus • sediment budgets • sediment deposition and storage • sediment management • sediment sources • sediment-associated contaminants 	Subject Editors Dr. Philip N. Owens Senior Research Fellow, Cranfield University, North Wyke Research Station, Okehampton, Devon EX20 2SB, UK philip.owens@bbsrc.ac.uk <i>From January 2007:</i> Chair in Landscape Ecology, Environmental Sciences Program, University of Northern British Columbia, 3333 University Way, Prince George, British Columbia, V2N 4Z9 Canada
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Challenges

by Philip N. Owens

Now, perhaps more than ever, there is a need for society to manage its resources in an effective and sustainable way. Statistics show that, when viewed globally, natural resources are being consumed at an ever-increasing rate. There is also a trend of an increase in the degradation (e.g. pollution) of natural resources such as water, air, soil and sediment, which impacts on the ability of these resources to perform and deliver important functions. As scientists, managers and regulators it is our duty and responsibility to address these environmental problems by offering solutions (scientific and technical) and by changing societal behaviour either through education or through enforcement (e.g. policy and legislation).

Over the last few decades there has been much progress. We have seen a realization of the interconnectivity of different types of resources through the use of 'systems' approach and an appreciation of how systems behave over time and space. For sediment dynamics, this has seen a movement towards the river basin as a meaningful system or unit for both study and management. Scientifically we have made many important developments. Some of these include the development of tools for understanding system behaviour and for informing management. Two examples of tools that have been developed over the last three or four decades, that deserve particular mention, are conceptual and numerical models (Apitz and White 2003, den Besten et al. 2003, Förstner and Westrich 2005, Koethe 2003, Kuijper 2002, Owens 2005), and sediment fingerprinting and tracing techniques. In the case of the former, there are now models that can route sediment through river basins, from hillslopes to coasts. In the case of the latter, we can now identify from where sediment (and contaminants) have originated and can physically trace sediment movement from sources to sinks. We have also seen important advances in our understanding of what sediment actually is, such as the understanding of composite particles, and what components of sediment are important for river functioning (Brack et al. 2006, Förstner et al. 2004). In particular, the role of organic sediment is now seen as important for contaminant fluxes and for water and habitat quality. – But there are many challenges ahead of us. With a move towards more accountable public funding of research, the scientific community is increasingly obliged to undertake research so as to assist with the sustainable management of the environment. In the case of river basins, research into soil and sediment dynamics should be targeted in order to maintain soil functions, aquatic ecosystems and human health, as part of a

broader remit of sustainable soil-sediment-water resources development at the global scale (De Pippo et al. 2006, Förstner 2003). In this respect we need to improve the tools that we have been developing so that they provide the necessary information for decision making. We need to improve the accuracy and reliability of these tools and understand the uncertainties that inevitably come with trying to represent an inherently complex system. We also need to link biogeochemical understanding with socio-economic considerations: many existing models work well on one aspect but at the river basin scale the biogeochemical and socio-economic aspects are ultimately interconnected. A key developing issue for soil-sediment-water management at the river basin scale is the identification and involvement of stakeholders in the decision-making process (Netzband 2004, Owens et al. 2004). With soil-sediment-water management increasingly moving towards the scale of the river basin, it is clear that the complexity of the issues is such that stakeholders must be involved if sustainable solutions are to be developed that balance the needs of the environment and society. These are exciting times, but the clock is ticking.

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Section 4: Sediment and dredged material treatment

<p>Responsible for:</p> <ul style="list-style-type: none"> • dredged material treatment and disposal • sediment geochemistry <p>Areas of interest</p> <ul style="list-style-type: none"> • acidification • building and environment • contaminated sediments • dredged sediments • fate and behaviour of metals • geochemistry • hydrogeology 	<p style="text-align: center;">Subject Editors</p> <p style="text-align: center;">Dr. Kay Hamer University of Bremen FB 5/Geochemistry and Hydrogeology Postbox 330440 28334 Bremen Germany khamer@uni-bremen.de</p>
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Challenges

by Kay Hamer

Owens & Batalla (2004) estimated that European-wide approx 700,000,000 m³ sediments are deposited in deltas, estuaries, harbours and coastal waterways or are discharged into the sea, annually. 200,000,000 m³ of these sediments have to be dredged to maintain shipping. All those dredging projects have its own boundary conditions considering volume, physical and chemical characteristics of the sediment and time frames for dredging. During maintenance work a more or less foreseeable throughput of sediments with physical and chemical quality varying in a known range can be expected. In contrast to that, remediation and capital dredging projects deal with discontinuously dredged sediments of very different types.

While simple techniques such as dumping into the sea or rivers, disposal in landfills and landfarming can cope with differences in quantity, quality and supply, the more technical applications for dredged material such as decontamination or substitution of primary materials in civil engineering require a more constant quality and quantity. Any step of storage or homogenization to control or guarantee constant sediment characteristics, can rise the costs. So it is always a challenge to bring the boundary conditions of dredging and those of any potential treatment and reuse together.

Besides such management plans, technology will be developed all the time (Förstner et al. 2001, Hamer et al. 2003, Ohimain 2004, Stichnothe et al. 2005, Vermeulen et al. 2003). In the end of the planning phase of any dredging project there will be the choice between different feasible options which have to be assessed considering economics and environmental impacts. Such an assessment should not base on a single tool e.g. a cost calculation or a life cycle assessment (LCA), because no tool covers all fields necessary to be considered (economy, environment, society). The European expert network SedNet recommended that a combination of tools (such as costs, LCA, cost-benefit evaluation, risk assessment studies) should become routine before decision-making (Bortone et al. 2004). Additionally, European standards for assessing treatment and disposal alternatives should consider the present know-how about long-term effects such as the life-cycle of sediments and

products and effects on mobility and bio-availability of pollutants with time.

To sum up, managing dredged sediments is an important and thematically wide spread field. Section 4 'Sediment and dredged material treatment' will give the treatment techniques, investigated in different scales ranging from lab to demonstration scale, a forum. It would be very welcome to see these techniques in relation with the boundary conditions of dredging projects because the boundary conditions of the dredging project are very often the starting point of the discussion how to manage sediments. Very important are scientific investigation focusing on the assessment of disposal and treatment procedures as well as treatment products because these assessment studies provide decision makers with the information on long-term effects of potential treatment options.

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