



Sed
Net

*Sediment
Challenges and
Opportunities due
to Climate Change
and Sustainable
Development*

First Announcement and
Call for Abstracts

12th International SedNet Conference
Nouveau Siècle Conference Center, Lille, France

co-organised by BRGM



Geoscience for a sustainable Earth
brgm

29 June - 2 July
2021

Background

Sediments found in upland streams, industrialised waterways, busy coastal zones and offshore waters are characterized by a wide variety of sediment properties in dynamic and less dynamic areas. These areas are inherently interlinked as sediment is transported from catchment to the open sea. The natural flow of sediment from mountainous regions to the ocean is strongly impacted by anthropogenic activities along this journey in terms of both the quantity that is transported and the quality of transporting waters. Sediment distribution is not only impacted by direct human influence but also indirectly as a result of changing weather and climate patterns. A change in sediment dynamics leading to sediment starvation or sediment accumulation is often the concern of river basin and coastal managers who constantly need to adapt to these environmental variations.

Often overlooked, there may be direct and indirect effects of climate change on sediment quality, too. More frequent flash floods may erode deeper and older, more contaminated sediment layers and spread it onto flood plains. Increased UV radiation may change degradation of contaminants. Increased water temperatures will have an effect of contaminant transfer in the food chain. Little information is currently available to predict whether sediment managers will have to cope with greater or different quality problems in future due to the climatic changes.

At the SedNet 2021 conference “Sediment Challenges and Opportunities due to Climate Change and Sustainable Development” we invite abstracts for a series of sessions aiming to explore these challenges and proposed solutions. This includes how policies and plans are developed for the range of often interlinked issues experienced along the journey from upland areas to the deeper waters. Questions related to how sediment quality should be assessed, sediment as an ecosystem service and how excess sediment can be used beneficially shall be addressed. The challenges posed as a result of anthropogenic influences, resource exploitation and climate change shall also be explored as well as examination of emerging contaminants from waste and waste water.

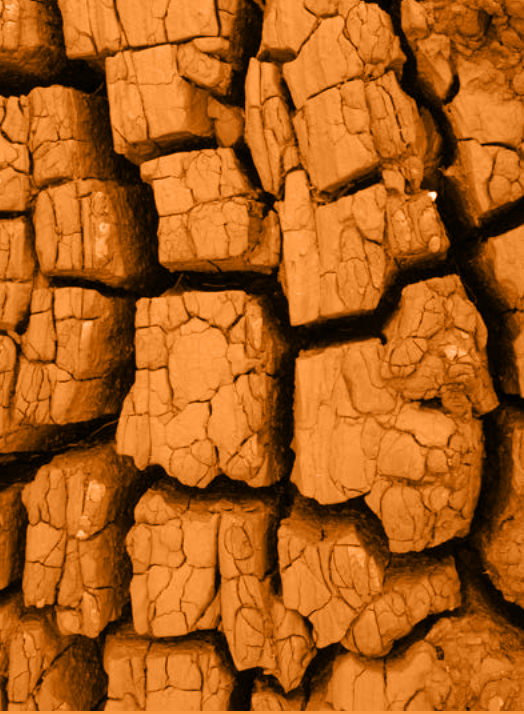
The proposed thematic sessions are:

- 1. CLIMATE CHANGE AND SEDIMENTS: DIRECT AND INDIRECT CONSEQUENCES AND OPPORTUNITIES**
- 2. SEDIMENT HABITATS, BIODIVERSITY AND ECOSYSTEM SERVICES**
- 3. CIRCULAR ECONOMY – SEDIMENT AS A RESOURCE**
Remediation and uses / Building with dredged materials and/or sediments
- 4. SEDIMENT MANAGEMENT CONCEPT AND SEDIMENT POLICY**
Policy for sediment management / Transboundary sediments & innovative maintenance of river delta sea systems
- 5. SEDIMENT QUALITY GUIDANCE, SEDIMENT QUALITY ASSESSMENT**
Sediment quality assessment, analytical methods, quality guidance
- 6. HOW TO DEAL WITH EMERGING SUBSTANCES / PFAS / MICROPLASTICS**
- 7. IMPACTS OF DISTURBED SEDIMENT CONTINUA AND MITIGATION MEASURES?**
Sediment balance / Understanding sediment fluxes and budgets on a river basin scale / HORIZON Europe / Land use impact of sustainable sediment management
- 8. SEDIMENTS IN COASTAL-MARINE MANAGEMENT AND EU STRATEGIES**
HORIZON Europe / Blue Growth
- 9. SUSTAINABLE FOOD PRODUCTION AND/OR CONSUMPTION SOLUTIONS AND THEIR EFFECT ON SEDIMENTS AND CLIMATE CHANGE**

Deadline for submission of abstracts: **1 December 2020**

Abstracts will be selected by the SedNet Steering Group for either a platform presentation or a poster presentation.

Please see <https://sednet.org/events/sednet-conference-2021/> for the template for submission of abstracts to the SedNet Secretariat: marjan.euser@deltares.nl



Conference Programme

THEME 1

Climate change and sediments: direct and indirect consequences and opportunities

The climate is changing. Rising temperatures, prolonged dry or wet seasons, flooding, wild fires, shifting rain and wind patterns, rising global mean sea levels and reduction of ice cover will become the new normal. The European Environment Agency states that in Europe, wet regions will become wetter and dry regions drier. A recent study by Newcastle University on the future impact of flooding, droughts and heatwaves on urban areas predicts a worsening of heatwaves for all 571 cities included in the study. This means increased drought conditions in Southern Europe and more severe river flooding in North-West Europe, with the British Isles being among the most heavily impacted areas. Such forecasted changes in water quantity raise concerns regarding human health and safety, but also regarding water quality. Considerably less attention has, to date, been paid to the impacts that these climatic changes may have on sediments in rivers and inland waterways and along our coasts. Impacts may be negative but opportunities may also arise.

Sediments often present an obstacle for navigation. How will changing hydrodynamics affect sediment accumulation and transportation patterns of sediments and sediment-bound pollutants along waterways and coasts? Will changes in the frequency of hydrological extreme events have a long-term impact on freshwater habitats? In what way could the predicted increase of water temperature in European rivers, by up to 2° C during longer periods of the year, impact sediment-related processes such as nutrient recycling and contaminant transformation? And how could sediment management contribute to managing the impacts and climate change adaptation?

Few studies have tackled these questions of direct or indirect effects of climate change on sediment dynamics and sediments' functions; including whether these effects might be negative, positive or a mix of both. Consequently, we would like to invite abstracts, which address the impact of changing environmental conditions on sediments, and ask authors to discuss their results in the context of climate change. This session will also explore whether more attention should be paid to sediment science and management in the context of climate change. Other examples that could be discussed are modification of sediments by UV, drying of contaminated sediment fields, and drainage of contaminated river banks due to increased rain fall.

THEME 2

Sediment habitats, biodiversity and ecosystem services

The European Environment Agency (EEA) in its “European waters Assessment of status and pressures 2018” report indicates that hydromorphological alteration was, and to date still is, the number one reason for not achieving the European Water Framework Directive (WFD) objectives. In this EEA report it is also stated that hydromorphological alterations “comprise all physical alterations to water bodies (including continuity interruptions) that modify their channels, shores, riparian zones and water levels/flows, such as dams, embankments, channelization and flow regulation. These activities may alter the morphology and hydrology of water bodies and result in modified/degraded habitats, with significant impacts on ecological status”.



Since the 2011 conference SedNet included sediment related biodiversity and ecosystem services provision as a conference theme. For the 2021 conference we would now specifically **welcome abstracts that address and provide insight in the relation between hydromorphology and sediment and how this influences WFD objectives**. How do alterations in hydromorphology alter sediment distribution and how does that influence biodiversity and provision of ecosystem services? We would also welcome abstracts where solutions have been tested to improve or restore hydromorphology and thus can demonstrate also an improved sediment balance and/or an enhanced provision of sediment related ecosystem services.

THEME 3

Circular economy – sediment as a resource

Remediation and uses / Building with dredged materials and/or sediments

Circular economy (CE) for sediments is promoting the beneficial use of dredged sediments for sustainable applications instead of disposal or landfill, and more generally introduce a beneficial use perspective when designing sediment management projects.

- Dredged sediments are one of the biggest potential waste flows, according to regulations
- Dredged sediments are mostly disposed of, at sea or on land
- Sediments are part of our potential mineral resources (but also of our environment)

Sediments are thus eligible for circular economy thinking.

This includes:

- Reducing disposal at sea and on land
- Promoting and increasing the use of dredged sediments as minerals and aggregates for industry
- Potential for land improvement - landscaping mound, brownfield refill, coastal nourishment, energy crops on derelict land - land uplift
- Comparisons between a direct approach (direct costs/tendering/linear economy) and indirect benefits (environmental, land use, reduced mineral extraction)
- Regulatory issues: Waste status - disposal at sea (relocation) - disposal on land (temporary or long term) – product status for reuse
- Promoting sediment beneficial use acceptability
- Lessons learnt from case studies
- Knowledge gaps or bottlenecks requiring action for beneficial use development

Circular economy options must not be in competition with natural uses (river management, coastline balance), they cannot include deliberate extraction. They must focus on sustainable uses of sediments that need to be dredged for maintenance or safety purposes (navigation, flood or coastline protection, environmental remediation). All aspects of research, development, regulatory or policy support, or success stories are welcome in the CE session.

THEME 4

Sediment management concept and sediment policy

Policy for sediment management / Transboundary sediments & innovative maintenance of river delta sea systems

Several member states and several river basin commissions have made already a sediment management concept (SMC) or are in the process of making one. These SMC's make recommendations on which sediment measures should best be taken in each part of the catchment. The content of the SMC's is used as input for sediment and water related plans like the river basin management plans and the flood risk management plans.

In this session, experiences and lessons learned while making sediment management concepts and experience implementing them will be shared. Presentations about sediment policy evolutions in general in different member states are also welcome. In doing so, we hope to learn from each other, so that sediment policies all over Europe and the rest of the world can be improved.

The updates of the Water Framework Directive (WFD) river basin management plans (RBMPs) for 2022-2027 are due in 2021. The aim of this session is also to explore how far the management of sediment quality and quantity has been (or will be) incorporated in the current and future RBMPs in various countries.

THEME 5

Sediment quality guidance, sediment quality assessment

Sediment quality assessment, analytical methods, quality guidance

Since contaminated sediments have profound implications for the ecological quality of aquatic ecosystems, sediment quality assessment is performed to some extent as part of monitoring activities to meet policy requirements (e.g. WFD, MSFD, Regional Seas Convention) and for informing management decisions (e.g. dredged material relocation). However, studies of contaminated sediments are not high on the social or research agendas, which is attributed to an unclear connection between sediment contamination and impacts on biota and to the complexity related to characterization of this environmental matrix. In this session scientists are invited to present their latest results with respect to the following topics:

- Innovative analytical methods for the determination of pollutants in sediments and suspended particulate matter, especially on methods to distinguish between naturally enriched and contaminated sediments
- Methods to improve our knowledge on bioavailability and the linkages between contaminated sediment and biological impacts, especially in a WFD context
- Improvements in the development of Environmental Quality Standards for sediments under the WFD and Action Levels for dredged material
- Initiatives for sharing data and the harmonization of methods for the characterization and assessment of contaminated sediment
- Case studies showing the link between sediment-associated contaminants and WFD criteria supporting ecological and chemical status
- Studies on elaborated measurements of radionuclides and toxic heavy metals in sea sediments, including radiometric dating of environmental archives such as sediments cores and corals, for reconstruction of pollution/climate change history in aquatic environments
- Remediation of contaminated sediments

THEME 6

How to deal with emerging substances / PFAS / Microplastics

Contamination of sediment due to pollutants is still one of the key problems of sediment management. European and national legislation identified numerous compounds for which it has adopted measures to reduce emissions and monitor their presence in the aquatic environment. However, at the same time, new substances known as emerging micropollutants are also gaining increasing attention as ubiquitous contaminants. Among them are for example microplastics, pharmaceuticals, flame retardants, quaternary ammonium compounds (QAC), rare earth metals, quaternary phosphonium compounds (QPC) and per- and polyfluoroalkyl substances (PFAS). Some of them such as the QPCs and PFAS also raise considerable concerns in terms of persistence and (eco)toxicity. Another important environmental issue is due to microplastics (MP) accumulated in marine and freshwater sediments, which increased significantly the environmental degradation of synthetic polymers and the formation of nanoplastics.

Therefore, in this session, scientists are invited to present their latest results on emerging micropollutants, also in order to define future monitoring strategies and sediment management, with respect to the following topics:

- Innovative analytical methods for the determination of emerging micropollutants in sediments and suspended particulate matter



- Non-target approaches for the detection and identification of unknown sediment contaminants
- Occurrence and fate (e.g. sorption, remobilization and transformation) of emerging micropollutants in sediments
- Transport of these contaminants in suspended particulate matter
- Microplastics and nanoplastics in sediments with respect to sampling, sample preparation, analysis, occurrence, transport and environmental impact and resulting management necessities
- Effects of all of the above on aquatic and benthic organisms
- Management and treatment options for emerging contaminants and microplastics

THEME 7

Impacts of disturbed sediment continua and mitigation measures?

Sediment balance / Understanding sediment fluxes and budgets on a river basin scale / HORIZON Europe / Land use impact of sustainable sediment management

In Europe, most river basins are facing a sediment disbalance, leading to a surplus of sediments in reservoirs and a deficit in free-flowing sections. Reservoir sedimentation limits hydropower generation, increases flood risk and impacts the functioning of ecosystems. River bed erosion causes instabilities of bank protection measures with related flood risk issues, lowering of the groundwater level, lack of instream morphological features and related degradation of habitats. This in turn causes problems with ecosystem services. Navigation is impacted by unstable river beds and limited fairway depth on an always lowered general bed level. Finally, a lack of sediments leads to delta subsidence and coastal erosion. Thus, it is of utmost importance to have sediment balance for all European river systems. The aim of this session is to discuss the methodology, data and analysis needed to establish sediment balance. This includes improvement of the understanding of sediment fluxes and budgets on a river basin scale.

THEME 8

Sediments in coastal-marine management and EU strategies

HORIZON Europe / Blue Growth

Management of the coastal and marine zone focuses on sustainable use, development and protection of the coastal/marine environment and associated resources. Sediments play an intricate and important role in achieving these management goals, as sediment supply or lack thereof can influence water quality, navigation and the stability of the seafloor and adjacent coastlines. Sediment as a resource therefore is critically important in coastal and marine management.

Activities related to coastal industries, maritime transport and infrastructures (harbours, barriers, etc.) can influence the distribution of sediments. This may result in a lack of sediment leading to erosion and flooding or excess sediment leading to navigation and other water quality issues. Most harbours need to be periodically dredged for maintenance and quite often the volumes of dredged sediments are increasing and cause management issues. Morphological restoration of inter-tidal areas in salt marshes or reopening of river mouths and beach nourishment (emerged and/or submerged) are other issues where sediment management is very important.

In addition, driven by increasing demand for new resources of raw materials, there are new challenges with respect to seabed mining and development of technologies for research in these areas. These new opportunities have been identified by the European Union as one of the potential new blue-growth sectors.

Furthermore, another important subject considered by this session will be the development of advance methods for providing high quality environmental data for managing the effects and cumulative effects of these activities. We invite scientists and regulators to share their insights, new findings and developments related but not limited to following topics:

- EU policies and strategies for coastal-marine zone protection, sediment use and re-use
- Case studies with innovative approaches to coastal-marine zone management
- Equilibrium, or lack thereof, between land and sea such as erosion risk management
- The development of new technologies and methods for data gathering such as sea bed investigations and exploration



THEME 9

Sustainable Food Production and/or Consumption Solutions and their effect on Sediments and Climate Change

At the moment unsustainable food production and consumption are practiced worldwide. This has a major impact on the health of people, on our ecosystems and on climate change. More than 2 billion people are now overweight, while 800 million people are undernourished. Today half of all habitable land is used for agriculture. Of the 28,000 species evaluated to be threatened with extinction on the IUCN Red List, agriculture is listed as a threat for 24,000 of them.¹ Emissions from land use, largely agriculture, forestry and land clearing, make up some 23% of the world's greenhouse gas emissions. Counting the entire food chain (including fertilizer, transport, processing, and sale) takes this contribution possibly up to 37%.²

Through this all, unsustainable food production and consumption also has a huge impact on sediments and soils. While there are no global figures, it is probable that agriculture, in the broadest context, is responsible for much of the global sediment supply to rivers, lakes, estuaries and finally into the world's oceans. This leads on one hand to top soil loss, land degradation, excessive levels of turbidity in receiving waters, and to off-site ecological and physical impacts from deposition in river and lake beds. On the other hand the silt and clay fraction (< 63 μm fraction), is a primary carrier of adsorbed chemicals, especially phosphorus, chlorinated pesticides and most metals, which are transported by sediment and soils into the aquatic system. Vice versa current sediment management practices and climate change have possible effects on our (sustainable) food production and consumption.

In this session we are looking to hear about sustainable food production solutions and/or sustainable food consumption solutions and their (possible) effect on sediments and climate change (and vice versa). We look more specifically for abstracts about solutions to lower the worldwide amount of agriculture land, solutions to lower the impact of agriculture on sediment quantity and/or sediment quality either on the fields or at the edges of the fields, solutions in the rivers, etc.

¹ <https://ourworldindata.org/land-use>

² https://www.ipcc.ch/site/assets/uploads/2019/08/4.-SPM_Approved_Microsite_FINAL.pdf

Submission of abstracts

Please see <https://sednet.org/events/sednet-conference-2021/> for the template for submission of abstracts to the SedNet Secretariat: marjan.euser@deltares.nl

Deadline for submission of abstracts: **1 December 2020**
Decisions to abstract authors: February 2021
Preliminary Conference Programme: March 2021

Conference Organisation

The conference is organized by SedNet and BRGM.

Conference Venue

The event will be held at the Nouveau Siècle Conference Center, Lille, France. Lille was chosen because of the importance of ports and waterways for the region, but also for its dynamic industrial sector, a strong research and innovation network and, above all, the strong involvement of the Region regarding sediments and circular economy (SEDIMATERIAUX approach, ECOSED chair, ALLUVIO strategy with VNF, but also European projects, in particular USAR, SURICATES, VALSE, CEAMAS and GEDSET).

The latter constitutes one of the major goals of SedNet, where technological innovations and projects about the beneficial use of sediment are explored and integrated with governance issues such as development and re-development of land use, sustainable transport, and adaptation to climate change (flood control, coastal protection etc.).

Other themes cover the good management of sediments in rivers and along the coast, taking into account the objectives of European policies such as the Water Framework Directive, environmental quality, biodiversity, and improvement of environmental conditions through sustainable development.

Hosting the 12th international conference of SedNet is for Lille a recognition of its scientific excellence, of its very active research and innovation network, and of the close links between innovation and the development of an economic sector with a strong circular component.

Language

The language of the SedNet conference will be English. No translation facilities will be provided.

7th I2SM International Symposium on Sediment Management

Parallel to the SedNet conference, and at the same venue, the 7th I2SM International Symposium on Sediment Management will be held. See <https://i2sm2020lille.wp.imt.fr>. Registered participants of the SedNet conference will have free access to the I2SM symposium and side events, and vice-versa registered participants of the I2SM symposium will have free access to the SedNet conference and side events.

Meetings SedNet Working Groups

Monday 28 June 2021 is reserved for meetings of SedNet Working Groups. All conference participants can attend these WG-meetings, but registration is required.

Excursion

Field excursions are planned on ports or waterways sites. More information will be provided later.

Conference Fee

The conference fee will be determined in autumn 2020 and will be announced on the website of SedNet.

Costs for attending will be approximately:

Regular fee: 500 euro
Students: 150 euro
Gala dinner: 50 euro

The conference fee (incl. VAT) includes admission to the SedNet conference and the I2SM symposium.

A detailed SedNet Preliminary Conference Program will become available in March 2021.

Registration, Travel and Accommodation

Information about registration, travel and accommodation will be provided in detail in the Preliminary Conference Program.

COVID19

Please note that the conference dispositions may have to evolve to adapt to the sanitary conditions and regulations. The present document does not constitute a formal commitment by SedNet to hold the event as described. Further information will be provided at the registration step.



Further Information

If you have any questions please contact:

SedNet Secretariat

Deltares
PO Box 85467
3508 AL Utrecht
The Netherlands

Phone: +31 651286087

Email: marjan.euser@deltares.nl

Internet: www.sednet.org

Sed Net



The European Sediment Network (SedNet) aims to incorporate sediment issues and knowledge into European strategies to support the achievement of good status or potential and to develop new tools for sediment management. Its focus is on all sediment quality and quantity issues at the river-sea system scale, ranging from freshwater to estuarine and marine sediments. SedNet brings together sediment professionals from science, administration, industry and consultancy. It interacts with the various networks in Europe that operate at national or international level or that focus on specific fields (such as science, policy making, sediment management, industry, education). Special attention was devoted in recent years to the integration of sediment management in the Water Framework Directive implementation process, and particularly in the River Basin Management Plans.

For further information about SedNet see
www.sednet.org