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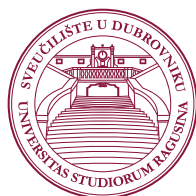


*Sediment
as a dynamic
natural resource
from catchment
to open sea*

First Announcement and
Call for Abstracts

11th International SedNet Conference
Hotel Dubrovnik Palace, Dubrovnik, Croatia

co-organised by Ruđer Bošković Institute and University of Dubrovnik
with support of IAEA



3-5 April 2019



Background

Sediments found in upland streams, industrialised waterways, busy coastal zones and offshore waters are characterized by a wide variety of sediment properties present 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. Historical or emerging contaminants may also hinder the management of these areas.

At the SedNet 2019 conference “Sediments as a dynamic natural resource – from catchment to open sea”, 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 such as how sediment quality should be assessed, sediment as an ecosystem service and how excess sediment can be used beneficially. The challenges posed as a result of anthropogenic influences, resource exploitation and climate change shall also be explored as well as emerging problems being examined such as contaminants resulting from discharge of waste.

The proposed thematic sessions are:

1. **SEDIMENT MANAGEMENT CONCEPT AND SEDIMENT POLICY**
2. **SEDIMENT QUALITY GUIDANCE, SEDIMENT QUALITY ASSESSMENT**
3. **HOW CAN SEDIMENT MANAGEMENT INFLUENCE ECOSYSTEM SERVICES PROVISION?**
4. **CLIMATE CHANGE AND SEDIMENTS: DIRECT AND INDIRECT CONSEQUENCES**
5. **CIRCULAR ECONOMY – SEDIMENT AS A RESOURCE**
6. **SOCIETAL IMPACTS OF DISTURBED SEDIMENT CONTINUA AND MITIGATION MEASURES?**
7. **THE IMPACT AND TRANSPORT OF MICROPLASTICS**
8. **BALLAST WATER AND SEDIMENTS – BWM CONVENTION**
9. **DEEP SEA SEDIMENTS**
10. **NUCLEAR AND ISOTOPIC ANALYTICAL TECHNIQUES IN SEDIMENT ANALYSIS**

Deadline for submission of abstracts: **1 October 2018**

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

Please see www.sednet.org for the template for submission of abstracts to the SedNet Secretariat: marjan.euser@deltares.nl



Conference Programme

THEME 1

Sediment management concept and sediment policy

Several member states and several river basin commissions have already made a sediment management concept (SMC) or are in the process of making one. These SMCs make recommendations as to what sediment measures should best be taken in each part of the catchment. The content of the SMCs 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 SMCs and implementing them will be shared. 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. Presentations about sediment policy evolutions in general in different member states are also welcome.

The updates of the Water Framework Directive (WFD) river basin management plans (RBMPs) for 2016-2021 were due in 2015. Another aim of this session is to explore how far the management of sediment quality and quantity has been incorporated in the RBMPs in various countries and/or which SMCs are foreseen for the RBMPs and flood risk management plans due in 2021.

Questions to be addressed include: is management of sediment quality and quantity a “significant water management issue” according to the EU Water Framework Directive in your country and has sediment quality and quantity also been addressed in flood risk management plans?

If not, is there an intention to incorporate sediment management into river basin management plans 2022-2027 and flood risk management plans 2022-2027 due in 2021?

THEME 2

Sediment quality guidance, sediment quality assessment

Sediment quality assessment is performed in different contexts including dredged material characterisation and environmental monitoring. In almost all cases, sediment quality assessment should help answer questions for making sediment management decisions, such as: is the sediment contaminated? Can contaminated sediment compromise environmental and human health? Is remediation or are other risk reduction measures necessary and if so, which remediation option is preferred? These are, among others, the type of questions to which assessment tools (i.e. chemistry, ecotoxicology, ecology, modelling) should respond. Although a large number of tools have been developed and implemented in a scientific context, it is necessary to identify the most appropriate for providing answers to key questions of decision makers. This is especially important in the context of limited resources and different priorities among stakeholders. Although a certain level of flexibility is necessary, it results in diverse assessment frameworks due to the lack of common objectives, assessment tools, data interpretation methods and communication strategies. In this session, SedNet would like to address the following questions: do regulators and decision makers have the appropriate tools to answer the driving questions of sediment quality assessments? Do existing tools allow decision makers to prioritize between slightly contaminated and severely contaminated sites? Do existing tools deal enough with variability, for example in the results of ecotoxicity tests? Are appropriate guidance documents available to help decision makers in sediment quality and risk assessment? Should existing tools be updated? If so, what is preventing the smooth transfer of tools from science to policy and regulation?

THEME 3

How can sediment management influence ecosystem services provision?

Sediment is a natural part of marine and freshwater ecosystems. Sediment management - including water and sediment diversions, infrastructure development, dredging and sediment relocation - has an effect on the morphology, hydrology and ecology of these ecosystems. Thus changes to the sediment balance can in- or decrease the benefits that ecosystems provide to society. Those benefits are called ecosystem services.

The ecosystem services concept provides a framework for the integrated assessment and valuation of the effects of anthropogenic influences and sediment management for stakeholders whose interests are influenced by these changes, as well as for society in general.

To discuss the actual potential of the application of the ecosystem services concept in sediment management, we welcome abstracts presenting real-world examples (both success stories and failures) of such application.

Examples can demonstrate applications of the ecosystem services concept for sediment management, such as the

design of the overall sediment management strategy, environmental impact assessments, cost-benefit analyses of different measures, beneficial reuse of sediment, the involvement of stakeholders, the finding of financial support, etc. Examples are welcome from anywhere in the world.

THEME 4

Climate change and sediments: direct and indirect consequences

The climate is changing. This results in rising temperatures, prolonged dry or wet seasons, wild fires, shifting rain patterns, rising global mean sea levels and reduction of ice cover. 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 that were examined 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 is paid to impacts that these climatic changes can have on sediments in rivers and inland waterways. Sediments often present an obstacle for navigation. How will changing hydrodynamics affect sediment accumulation and transportation patterns 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 in the year impact the processes in sediments regarding nutrient recycling and contaminant transformation?

Few studies have tackled these questions of direct or indirect effects of climate change on sediment dynamics and sediments' functions up to now. 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. During this session we would like to discuss whether more attention should be paid to sediment science and management in the context of climate change.

THEME 5

Circular economy – sediment as a resource

Dredged sediments are often disposed of at sea or on land, and considered as waste, according to national regulations. There is, as of yet, no other defined status for dredged sediments across Europe. As a result, dredged sediments are considered one of the bulkiest waste flows in Europe.

However, sediment can also be seen as a resource - a large supply of minerals or building material, easily accessible by water transport in many regions of the world. This qualifies sediments as first priority targets for circular economy and reuse.

Despite the long established tradition of management by disposal, EU-funded projects (e.g. Prisma, GeDSeT, Setarms, CEAMaS) investigated reuse scenarios and attempted to fill technology gaps. They succeeded in identifying viable reuse opportunities. Current projects (e.g. Valse, USAR, Suricates) build on this outcome and move from laboratory to industrial scale pilots to demonstrate further that reuse is a sustainable alternative to disposal and minerals extraction. This was showcased in a lively Sediments and Circular Economy session at the SedNet 2017 Conference in Genoa and we will continue the discussion in 2019 in Dubrovnik.

Topics to be discussed include (but not only) port and waterways dredging; enlargement of navigation capacity and sustainable transport; disposal and relocation; potential as a resource (civil engineering, concrete, cement, landscaping, brick and tile, shoreline defences, port extension etc.); land improvement and uplift; brownfield and derelict land application; coastal nourishment; energy crops; waste or product status; direct costs/linear economy and indirect benefits/land use; reduced mineral extraction; environmental/circular economy; policy frameworks that enhance sediment reuse.

THEME 6

Societal impacts of disturbed sediment continua and mitigation measures?

In our previous SedNet conference (Genoa, 2017) we had a series of presentations in the session "Sediment Balance" that clearly demonstrated that human interferences have severely disturbed sediment continua in many river-sea systems globally.

For the upcoming, 2019 SedNet conference we would welcome to receive abstracts presenting real-world examples of:

- the impacts of these disturbances, i.e. of impacts to river engineering (e.g. river bed degradation), to ecology (e.g. the consequences of disturbed hydro-morphology), to society (e.g. consequences for water security) and/or to economy (e.g. costs for navigation or for the hydropower sector);
- good or best practice mitigation measures aimed at restoring disturbed sediment continua, preferably also giving insights in their actual costs.

These real-world examples may be site specific, but we would above all welcome examples that address a larger stretch of a river-basin, or even an entire river-sea system.

THEME 7

The impact and transport of microplastics

Microplastics are often classified as plastic particles smaller than 5 mm. Contamination from primary and secondary microplastics in fresh and marine environments results from weathering of larger plastic fragments or releases of wastewater treatment plants or run-off. The fact that microplastics are very hard to degrade means that the extent of microplastics in global water bodies is dramatically increasing. Microplastic particles are already present globally in high concentrations. Due to their physical properties, the microplastics remain in suspension and have the potential to be discharged into the sea together with other riverine suspended matter. Regarding the marine environment particular attention has been placed on how the presence of microplastics, and their effects, can constitute a threat and therefore influence ecosystem quality. The Marine Strategy Framework Directive (MSFD) that determines the framework for Member States to achieve a Good Environmental Status (GES) by 2020, now includes marine litter and microplastics as a crucial indicator.

The impacts of microplastic particles are numerous. Of primary concern is the impact on biota due to their physical, physiological, immunological and toxic effects and the resulting harmful effect on the food chain. How microplastic particles are weathered, transported and in turn influence the transport of fine sediments is currently under investigation in several research projects. Moreover, it is discussed if organic and inorganic contaminants sorb on microplastics and pose a serious risk to human health or the environment. In fact, the plastic debris, in addition to adsorbing hydrophobic pollutants (e.g. PCBs, DDT etc.) also release contaminants (such as phthalates, bisphenol A, PBDE, alkylphenols) as they degrade.

From a sediment management perspective the presence of microplastic particles may also influence sediment fluxes. In the Netherlands, concentrations up to 3600 particles kg⁻¹ dry sediment have been reported along the Dutch coast.

This session will examine the impact of microplastics and their weathering on aquatic ecosystems and how to tackle the transport of these abundant contaminants, including the interaction with inorganic sediment particles.

THEME 8

Ballast water and sediments – BWM Convention

The International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention) entered into force on 8 September 2017. Under the BWM Convention, all ships in international traffic are required to manage their ballast water and sediments to a certain standard, according to a ship-specific ballast water management plan. Harbours and



terminals where cleaning or repair of ballast tanks occurs also have to ensure adequate facilities for the reception of sediments. Sediments considered by the BWM Convention refer to matter settled out of ballast water within a ship. Their presence in ballast waters imposes the limits on applicability of process technologies used in ballast water treatment. For example, the presence of sediments drastically reduces the effectiveness of UV irradiation because the sediment particles protect small organisms from exposure to irradiation. This makes management of ballast waters even more complex. Furthermore, some organisms in ballast water (e.g. toxic dinoflagellates, some crustaceans and rotifers) have the ability to create a resistant dormant state (cyst) in unfriendly environments, such as ballast tanks. These cysts accumulate in sediment and can survive extremely unfavourable conditions. When discharged in a new environment they can represent the origin of a new population.

The key barriers to adaptation of viable BWM solutions identified so far are lack of data (e.g. the presence and invasiveness of harmful aquatic organisms and pathogens, BW uptake and discharge activities, sediment disposal, chemical pollution with BW) and a lack of knowledge (e.g. port baselines and monitoring, BW sampling for compliance control, risk assessment, how to deal with non-compliant vessels, early warning systems, effectiveness of BWM systems and measures, available technologies and their advantages and limitations). We invite researchers to exchange their experience and knowledge on these issues.

THEME 9

Deep sea sediments

Deep sea sediments are a fast emerging field considering that the exploration and prospecting at sea depths greater than 1000 m has become more affordable with development of robotics and artificial intelligence. Today it is well known that deep sea sediments contain large resources of gas hydrates, rare earth elements and other valuable minerals such as manganese and phosphate nodules and seafloor massive sulphides. It is only a matter of time until commercial exploitation will begin.

Deep sea mining has been identified as one of the potential new blue growth sectors by the European Union, driven by increasing demand for new resources of raw materials. Potential impacts of deep sea mining include physical destruction of the seabed, creation of sediment plumes, release of toxic chemicals and loss of biological diversity. Recent studies have shown that gas hydrates found in deep sea sediments act as large reservoirs of the Earth carbon, which might become unstable with global climate change. On the other hand, gas hydrate deposits may be utilized in the near future as a new and environmentally sound energy resource, which can contribute to the reduction of net CO₂ emissions from fossil fuels given that the release of the gas bound in hydrates can be induced by the injection of CO₂. In this way even more stable hydrate material is produced and the stability of the geological formation remains intact, yet another greenhouse gas is sequestered. Due to all these different aspects deep sea sediments are included in the focus of blue growth research for enhancing our knowledge and abilities to explore, monitor and observe changes in deep sea sediments. This session addresses the need for knowledge exchange in environmental and technological issues related to the exploitation of deep sea sediments and invites experts to share their recent achievements with the SedNet community.

THEME 10

Nuclear and isotopic analytical techniques in sediment analysis

The increasing exploitation of coastal areas poses serious environmental challenges and requires science-based policies for a sustainable management of marine ecosystems and resources. Knowledge on pollution levels and trends is essential to define environmental protection measures. The study of sediments helps to improve the understanding on coastal pollution as sediments act as a sink for inorganic (radionuclides and heavy metals) and organic (nutrients, hydrocarbons, pesticides etc.) contaminants from various sources. Nuclear and isotopic analytical techniques, when applied together in an undisturbed sediment core, can provide information on the spatial and temporal trends of pollutants. They can also be used as a record of historical temperature variations and fate of carbon in sediments, thus enabling carbon storage assessment and evaluation of positive and negative synergies between pollution loading and potential of sediments to sequester carbon.

We welcome abstracts on elaborated measurements of radionuclides, toxic heavy metals and organic contaminants in sediments, including radiometric dating of environmental archives such as sediments cores and corals, for the reconstruction of pollution/climate change history in marine environments.



Submission of abstracts

Please see www.sednet.org for the template for submission of abstracts to the SedNet Secretariat: marjan.euser@deltares.nl

Deadline for submission of abstracts: **1 October 2018**
Decisions to abstract authors: 15 November 2018
Preliminary Conference Programme: December 2018

Conference Organisation

The conference is organized by SedNet, the Ruđer Bošković Institute and the University of Dubrovnik, with support of the International Atomic Energy Agency (IAEA).

Ruđer Bošković Institute is a Croatian multidisciplinary national center for natural sciences research and was founded in 1950. It employs 550 academics and students in the fields of experimental and theoretical physics, chemistry and materials physics, organic and physical chemistry, biochemistry, molecular biology and medicine, environmental and marine research, computer science and electronics.

The University of Dubrovnik has its roots in various successive institutions dedicated to the teaching and research in maritime and marine sciences as well as tourism. It was established in 2003 on the foundations of a very long tradition which goes back to the 17th century, but also on decades of modern higher education.

At present, UNIDU consists of seven departments and two institutes with diversified programmes, but the maritime and marine sciences remained its traditional strength.

The International Atomic Energy Agency (IAEA) is an international organization that seeks to promote the peaceful use of nuclear energy. Nuclear techniques can help to map, date and assess the quality of sediments and to identify threats to the ecosystem. The IAEA supports many technical cooperation programmes that help countries to monitor emissions and environmental changes to the land, ocean and ecosystems, mitigate sources of pollution and greenhouse gas emissions from energy production and land use, and adapt to new climate realities including food and water shortages and ecosystem losses by using nuclear and isotopic techniques in a safe and secure manner.

Conference Venue

The conference is organised at the Conference Hotel Dubrovnik Palace, Croatia. The hotel is situated on the coast of the Lapad Peninsula, 4.5 km from the walls of the old city of Dubrovnik. All hotel rooms have magnificent panoramic views of the sea and nearby islands.

Dubrovnik, the pearl of the Croatian Adriatic, is on the UNESCO list of World Heritage Sites.

The city was founded in the 7th century. From the 14th to the 19th century it was the only city-state on the entire Croatian coast. Seafaring and trade, together with wise international policy and skilful diplomacy brought centuries of economic and cultural prosperity. The Dubrovnik people were known as good seafarers, tradesmen, scientists and writers.

The city has an interesting historical centre surrounded by city walls. The walls have defended the city from attacks from the sea and the mainland.

After his first visit to Dubrovnik the Irish writer George Bernard Shaw wrote: "If you want to see heaven on Earth you should come to Dubrovnik."

Language

The conference language will be English. No translation facilities will be provided.

Excursion

On the day prior to the conference (Tuesday 2 April) or on the day after the conference (Saturday 6 April) an excursion will be organised. Details will be announced in the preliminary conference programme.

Conference Fee

Regular fee: 400 euro, excl. 25% VAT

Students: 100 euro, excl. 25% VAT

If a student has submitted an abstract that has been selected for oral presentation, then his/her fee is waived.

The fee includes admission to the 3-day conference programme, social (dinner) events on the evenings of 3 and 4 April, and an excursion on Tuesday 2 April or Saturday 6 April 2019.

Details about the social events and excursion will be provided in the Preliminary Conference Program.

Registration, Travel and Accommodation

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



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Further Information

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Sed Net



SedNet is the European network which aims to incorporate sediment issues and knowledge into European strategies to support the achievement of good environmental 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