BOOK OF ABSTRACTS

1. SESSION DESCRIPTION

ID: B2b

Title of session:

Urban surface waters: ecosystem services, nature-based approaches and urban regeneration

Hosts:

	Name	Organisation	E-mail
Host:	David Lerner	U. of Sheffield & SUSTech	d.n.lerner@sheffield.ac.uk
Host:	Suzanne van der Meulen	Deltares & Wageningen University	Suzanne.vanderMeulen@deltares.nl
Host:	Lennart Kümper-Schlake	German Federal Agency for Nature Conservation (BfN)	lennart.kuemper-schlake@bfn.de
Co-host:	Junxiang Li	ECNU Shanghai	jxli@des.ecnu.edu.cn
Co-hosts:	Karsten Grunewald	Leibniz Institute of Ecological Urban and Regional Development	k.grunewald@ioer.de

Session description:

Urban surface waters (e.g. rivers, lakes, canals and wetlands) are multifunctional landscape elements, affecting various economic, environmental and cultural interests such as flood prevention and wildlife conservation. They are also important for urban regeneration and have additional complexities due to their effects on property values, residents' recreation and population health, and their roles in relation to waste water and ecologically within blue-green infrastructure.

The multiplicity of institutions in urban areas have traditionally managed urban surface waters disjointedly, resulting in inefficient decision making. However some local decision-makers see great opportunities to make use of nature-based solutions to respond to environmental challenges, improve cities and support human well-being. At the same time, many other decision-makers are still not convinced about the usefulness and cost-effectiveness of urban and peri-urban ecosystems to tackle climate induced risks for the urban dwellers. There is a general lack of knowledge on how to assess and value the complexity of ecosystem services and how to protect, restore or design urban surface waters, including using nature-based solutions, to maximise the urban and ecosystem returns.

Goals and objectives of the session:

- To present advances in the use of ecosystem services and nature-based approaches for urban surface water management and urban regeneration
- To record successful and less successful case studies
- To define what information is necessary for whom in assessment, mainstreaming and implementation
- To identify opportunities for future developments of concepts and tools

Planned output / Deliverables:

- Presentations and conference papers.
- A briefing note on future developments and tools.

Related to ESP Working Group or National Network:

BWG 2 – Freshwater systems

2. SESSION PROGRAM

Date of session: 13 December 2017
Time of session: 10:30 – 12:30

Timetable speakers

Time	First name	Name	Organization	Title of presentation
10:30	Huanying	Yin	World Future Council	Protecting and restoring blue-green infrastructure for regenerative city development
10:50	Ángel	Borja	AZTI	Fishers´ behavior versus perception: facts and figures from a restored estuary and the cultural ecosystem services and benefits recovered

Time	First name	Name	Organization	Title of presentation
11:08	Jere	Nieminen	University of Tampere	Functions and flexibility: Ecological succession and stakeholder networks operating in stormwater design
11:26	Ari	Jokinen	University of Tampere	The potentiality of nature-based solutions seen through ambiguities
11:44	Suzanne	van der Meulen	Deltares & Wagingen University	An extensive participatory monitoring program in Amsterdam where hundreds of citizens assess surface water quality
11:50	Karsten	Grunewald	IOER	Assessment of water-related urban ecosystem services – experiences from the Sino-German 'Green Cities Study'
11:56	Chong	Jiang	SUSTech	Public perceptions of ecosystem services of urban rivers in Shenzhen

Time	First name	Name	Organization	Title of presentation
12:05	Suzanne	van der Meulen	Deltares & Wagingen University	Facilitated discussion to identify opportunities for future developments and tools
12:30	Close of session			

3. ABSTRACTS

Type of submission: *Abstract*

B. Biome Working Group sessions: B2b Urban surface waters: ecosystem services, nature-based approaches and urban regeneration

Fishers´ behavior versus perception: facts and figures from a restored estuary and the cultural ecosystem services and benefits recovered

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Well-functioning ecosystems hold higher values of biodiversity and provide a wider range of ecosystem services. In 25 years, Nerbioi estuary (North Spain) shifted from being one of the most polluted estuaries in Europe to a near-recovered status, mainly due to the Wastewater Treatment Plant that started in 1990. Biotic and abiotic parameters monitored in the last decades show a clear improvement, but it is still unclear if the delivery of cultural ecosystem services (i.e. recreational fishing) improved. A questionnaire was used to study fishers' behavior and perceptions, and compared with environmental data. Results show a positive correlation between ecological recovery and fishers' behaviour, as the fishing activity expanded to the inner part of the estuary in accordance with its ecological recovery. However, fishers´ perceptions were more negative than demonstrated recovery, especially with factors related with catches (e.g. fish abundance). Yet, fishers are generally satisfied with fishing and revealed their intention to continue fishing in the estuary. This study concludes that a better functioning environment has the potential to deliver more and better cultural ecosystem services consequently improving human well-being. However, getting recovered ecosystem services to the level of appreciation and

enjoyment requires further communication efforts and understanding of human complexity.

Keywords: recreational fishing, environmental restoration, long-term monitoring, social benefits, questionnaire surveys

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B. Biome Working Group sessions: B2b Urban surface waters: ecosystem services, nature-based approaches and urban regeneration

Assessment of water - related urban ecosystem services - experiences from the Sino-German 'Green Cities Study'

Author(s): K. Grunewald
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Green spaces provide manifold regulating services regarding urban water cycles. The possibility of natural evaporation and infiltration ensures water regulation and circulation. Due to the growing challenges of dealing with the impacts of climate change, both in terms of varying precipitation schemes and of increasing heavy precipitation

events, these regulating services are becoming even more relevant. That will be shown by examples from Chinese (e.g. Sponge City concept) and German cities.

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B. Biome Working Group sessions: B2b Urban surface waters: ecosystem services, nature-based approaches and urban regeneration

The potentiality of nature-based solutions seen through ambiguities

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Nature-based solutions, i.e. alternatives to grey or technology-based infrastructure dealing with sustainability challenges, is a new concept. Recent research has found that it suffers from ambiguities that hinder its development, implementation and up-scaling. This paper sees ambiguities as an asset, as they reveal the concept's potential for transformative change in urban sustainability. Using stormwater systems as an example, we analyze the concept's ambiguities in relation to governance,

stakeholder contributions and urban development. We use interdisciplinary and practice-oriented research approach based on serial case studies within the Tampere urban area, Finland. The development and operation of stakeholder networks, business actors included, was followed in each case.

Cities typically adopt global policy models in their policy-making strategies for urban sustainability. In this process, the compact city agenda or other policy models are locally interpreted and combined with the city's profit-making aims, resulting in a local 'sustainability fix'. This development tends to lead to weak sustainability in which green issues have only supportive roles. Nature-based solutions seem variants of this development; however, they shift the perspective. They focus on specific environmental challenges, frame problems differently, and gather stakeholder networks accordingly. More importantly, they change the nature of ambiguities. This can be analyzed in more detail by focusing on the navigation between problem space and solution space, which we regard as the principle how nature-based solutions work.

We find that the following focus areas within nature-based

solutions are particularly important from the perspective of transformative change: (1) forms of organization of urban biodiversity and ecosystem services as socio-environmental trajectories, (2) multi-stakeholder networks and value co-creation, and (3) how the process associates with wider urban problems in experimental designs.

Keywords: ambiguity, sustainability transformation, nature-based solutions, multi-stakeholder networks, value co-creation

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B. Biome Working Group sessions: B2b Urban surface waters: ecosystem services, nature-based approaches and urban regeneration

Public perceptions of ecosystem services of urban rivers in Shenzhen, China

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The world is rapidly urbanizing, with both positive and negative consequences. One major challenge is how to secure the long-term quality of life for urban residents. Many studies on quality of life are based on 'material' ecosystem services (i.e., provisioning and regulating services), with less attention paid to the non-material benefits gained from nature (e.g., green and blue spaces),

which have been called cultural ecosystem services. These non-material services are shaped by intimate human-nature interactions and are often very important to urban residents. Understanding perceptions and awareness of cultural services provided by urban blue space (i.e., water and wetlands) and green space (i.e., urban forest and grassland) are therefore important to support planning, creation, and protection of these spaces. We assessed the cultural services provided by urban green and blue space in seven sites in Shenzhen, China, which has experienced rapid urbanization in the past three decades. By combining ecosystem services valuation with surveys (284 questionnaires in total), we gained insights into residents' perceptions of cultural services. The results showed that all the respondents linked cultural services from local sites to their individual well-being.

Approximately 60% of respondents visited the city's urban green and blue areas at least 1 to 2 times per week, evenly distributed between green and blue areas (i.e., 28% for forest, 23% for grassland, 23% for river and lake, and 26% for wetland). Surprisingly, the travelling cost, including ticket, fuel, and other expenses, varied a lot between different parks. The travelling cost to the Huaqiaocheng

Wetland Park (35.0 RMB per time) was over six times higher than that to the Donghu Wetland Park (5.5 RMB per time), but the former provided more recreational activities. More than 95% of the respondents were willing to pay for the maintenance of urban blue and green areas (an average of almost 80 RMB/year). The contributions of cultural services are likely to increase because the residents value natural ecosystems more in urban areas due to their rarity. We conclude that the management and protection of cultural landscapes should incorporate the different perceptions of local residents. The assessment of ecosystem cultural services should be pushed ahead as indispensable elements in the agendas of biodiversity conservation and cultural heritage preservation.

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B. Biome Working Group sessions: B2b Urban surface waters: ecosystem services, nature-based approaches and urban regeneration

An extensive participatory monitoring program in Amsterdam where hundreds of citizens assess surface water quality and potential for use

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Water Authorities can make use of citizen science to collect data and to raise awareness on water quality. The Clean Water Experiment is a successful example of water quality monitoring of by citizens. During the summer of 2017, a few hundred citizens of Amsterdam, the Netherlands, assessed the canals, lakes, rivers and ditches in the entire city. They assessed water quality parameters like turbidity,

temperature and E.coli, and they were asked to qualitatively judge water quality by indicating which services can be used, such as swimming, irrigation etc.

Through The Clean Water Experiment, citizens learned more about the quality of water in their surroundings. This may make it easier for them to make well informed decisions about how to use it, and some participants have already changed their behaviour with respect to the use of surface water. Another result of The Clean Water Experiment is that water managers and researchers now have a larger spatial and temporal coverage of water quality data in addition to monitoring data by authorities. This improves the insight in water quality in the city.

In this short presentation, we will show the main results of the project and discuss the issues to consider when starting a citizen monitoring campaign in general and how we dealt with these issues in Amsterdam.

The Clean Water Experiment is an initiative of: Deltares, Pavèl van Houten, Wageningen University & Research, Waternet, Waterschap Amstel Gooi en Vecht, KWR, Amsterdam Institute for Advanced Metropolitan Solutions (AMS).

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B. Biome Working Group sessions: B2b Urban surface waters: ecosystem services, nature-based approaches and urban regeneration

Functions and flexibility: ecological succession and stakeholder networks operating in stormwater design

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Urban ecosystem design provides an important entry point for practices seeking increased resilience and transitions toward urban sustainability. Active management of ecological succession is one of the challenges in design. Both biodiversity and a diversity of human activities are needed to increase the urban ecosystem services. However,

it is not well understood what kind of roles different actors are able to take in this process.

The purpose of this paper is to examine how stakeholders operate in the creation of stormwater systems in urban areas. The stormwater system planning projects aim to increase climate resilience and flood protection, but they also generate novel urban ecosystems and ecosystem services. Our task is to analyze how (1) the ecological succession takes shape in the institutional arrangements of stormwater system processes; (2) the stakeholders operate through networks; and (3) the stakeholders deal with uncertainties, the emerging possibilities, and the feedbacks arising in the ecological succession. We use three empirical cases of stormwater management areas in the largest cities in Finland; Helsinki, Vantaa and Tampere. We focus on practices and use observation method and interviews with the companies' landscape planners and city officials.

Our preliminary findings show that the shifting relations between functions and flexibility are crucial in the creation of stormwater system processes. Functions refer to the primary goal of creating more space for flooding water in the urban landscape. Functions are based on quantified

calculations and are attached to technical solutions of water purification, filtration and absorption. Flexibility refers to combinatorial dynamics through which the multiplicity of ecosystem services can be generated. We conclude that the reciprocal interaction between functions and flexibility can be used as an analytical lens to recognize different stakeholder–ecosystem relationships that increase the resilience of ecosystems, diversity of human activities and are potentially useful in urban sustainability transitions.

Keywords: ecological succession, stakeholder engagement, stormwater management, urban nature, ecosystem services

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B. Biome Working Group sessions: B2b Urban surface waters: ecosystem services, nature-based approaches and urban regeneration

Protecting and restoring blue-green infrastructure for regenerative city development

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Wetlands area key ecosystem type, and with it they form a significant part of the natural ecological space. Urban wetland locates at urban and peri-urban areas. Urban wetland in China consists almost 10% of total domestic wetland area. And it has the special position of symbiosis with human settlements, providing them with unique ecosystem services. Urban wetlands offer huge economic and ecological values in terms of

water conservation and purification, increase the resilience to flood and drought, contribute to leisure time of local residents and offer benefits for tourism development, environmental education, regulation of climate and maintenance of biological diversity. Governance of urban wetlands is a multidisciplinary work with integration of ecological, economical and societal sectors, organizations and interest groups. Guidelines for ecologically-sound protection, design and restoration of urban and piri-urban wetlands in China and feed into current policy-driven processes shall be developed to support local decision-makers in the establishment and management of ecologically sound urban wetlands to make the city eco-friendly, sustainable and regenerative, and to feed into national policy agenda to promote ecologically sound urban wetland management for regenerative city.

Keywords: urban wetland management, ecosystem service value, sponge service value, green finance, governance of urban wetlands