BOOK OF ABSTRACTS

This Book of Abstracts provides a comprehensive overview of the session content and is structured into three main sections:

I. Session Description – an introduction to each session, including its objectives and expected outputs
II. Session Program – a detailed schedule for each session, including speakers and timing
III. List of Abstracts – a complete compilation of all accepted abstracts

I. SESSION DESCRIPTION

ID: X17

Integrating Ecosystem Services Across Landscapes

Hosts:

	Name	Organisation	E-mail
Host (s):	Olivia Crowe	Imperial College London	o.crowe23@imperial.ac.uk

Abstract:

This session brings together interdisciplinary contributions on the assessment, management, and governance of ecosystem services across urban, peri-urban, and forest landscapes. It addresses the growing need to integrate ecological, social, and spatial perspectives in the face of urbanization, climate change, and land-use pressures.

The session includes a range of methodological approaches, such as spatial modelling, participatory assessments, and ecosystem service mapping, applied to topics including nature-based solutions, urban flood management, forest conservation, and multifunctional land use. Several contributions focus on how ecosystem services can support planning and decision-making in complex socio-ecological systems. In addition to biophysical assessments, the session highlights the importance of social dimensions, including stakeholder perceptions, policy implementation, and communication of environmental issues. Case studies from diverse geographic contexts provide insights into how ecosystem services can enhance resilience and inform sustainable development strategies.

Overall, the session aims to foster exchange on practical and innovative approaches for integrating ecosystem services into policy and management across different landscape contexts.

Goals and objectives of the session:

This session aims to present innovative methods for assessing, mapping, and integrating ecosystem services into planning practices

Planned output / Deliverables:

The session will deliver key insights on methods and applications of ecosystem services across landscapes, highlighting best practices and common challenges.

Session format:

The Standard session

Related to ESP Working Group:

Other

II. SESSION PROGRAM

Room: **B1**
Date of session: **Friday, 22 May 2026**
Time of session: **14:00 – 15:30**

Timetable speakers:

Time	Name	Surname	Organization	Title of presentation
14:00-14:05	Olivia	Crowe	Imperial College London	Introduction
14:05-14:10	Madalina Mioara	Buzatu	MDPI	Introduction MDPI
14:10-14:25	Andrea	Benedini	Politecnico di Milano	A Multi-Regime Ecosystem-Services Framework for Urban Flood Risk Management: a case study in Varese, Italy
14:25-14:40	Hristina	Prodanova	National Institute of Geophysics, Geodesy and Geography - Bulgarian Academy of Sciences (NIGGG-BAS)	The old good landscape maps: New interpretations enabling ecosystem services assessment of conservation potential at a national scale
14:40-14:55	Andrej	Bončina	University of Ljubljana	How to define priority areas for providing forest ecosystem services (FES): a novel approach for the spatially explicit assessment of FES
14:55-15:30				Discussion

III. LIST OF ABSTRACTS

The first author is the presenting author unless indicated otherwise

1. A Multi-Regime Ecosystem-Services Framework for Urban Flood Risk Management: a case study in Varese, Italy

***First author*:** Andrea Benedini
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Urban flood risk management (UFRM) is shifting beyond single-hazard, single-model approaches toward multifunctional and transdisciplinary strategies that deliver benefits across rainfall regimes (light, moderate, extreme). Yet a key bottleneck persists: stormwater assessments are often fragmented across event types and disciplines, limiting translation into spatially explicit planning priorities, especially in space-constrained cities. This study applies an ecosystem services (ES) framing of water cycle and flow mitigation (WCFM) to develop a regime-integrated indicator set for UFRM. The approach aligns storm-regime processes with the CICES classification and frames assessment around demanding, supplying, and benefiting areas

along connected drainage systems.
WCFM is represented as three interacting capacities: runoff regulation under light rainfall, peak-flow regulation and drainage-network failure prevention under moderate rainfall, and buffering and attenuation under extreme events. The approach is implemented in Varese (Northern Italy) through an integrated modelling chain linking surface and subsurface interactions among land use, soils, and drainage infrastructure. A curve-number runoff assessment supports the light-rain component, EPA-SWMM simulates network performance and node failures under moderate storms, and HEC-RAS estimates inundation and flood damages under extreme events. Outputs are aggregated to urban drainage units and translated into three regime-specific indicators (runoff coefficient, node-failure density, flood damages). Indicators are normalised and combined into a WCFM demand index. A complementary WCFM supply index represents locally accessible regulating capacity, and residual demand is derived as the mismatch between demand and supply within connected drainage areas.
Application to Varese shows WCFM priorities are regime-dependent: areas prioritised for frequent-storm runoff control do not systematically coincide with locations dominated by moderate-storm failures or extreme-event damages. Residual demand identifies neighbourhoods where needs persist because supply is insufficient or poorly positioned relative to hydrological connectivity. The main contribution is a demand-supply framework and composite indicator set that can be applied in urban planning to prioritise and sequence multifunctional UFRM measures across rainfall regimes.

Keywords: Demand-supply analysis, Water cycle and flow mitigation index, Ecosystem Services, Rainfall regimes, Residual demand index

2. The old good landscape maps: New interpretations enabling ecosystem services assessment of conservation potential at a national scale

First author: Hristina Prodanova
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The ecosystem services (ES) approach has been widely accepted in environmental policies and management as an adequate platform that can serve as a link between nature and society. Many ES are influenced by the landscape structure. Thus, national-scale landscape mapping can potentially contribute to nature conservation management. However, there are no attempts to directly link the ES assessment with the landscape units at a national level. In this paper, we propose an approach for the transformation of paper copy information from old landscape maps to enable the assessment of ES conservation potential at the national landscape scale. The conceptual scheme of the approach contains three main elements: (i) data acquisition; (ii) landscape and ES assessment data processing; and (iii) mapping of ES potential at a landscape level. The results reveal the landscape heterogeneity based on landscape classification and mapping at a national level and the ES conservation potential based on the analyses of the Natural Heritage (NH) in the country to provide ES. The assessment of ES conservation potential using the national scale landscape mapping allows us to analyze the spatial relationships between the landscapes with high conservation value and the existing nature protection network. The conceptual scheme of the study demonstrates how the results of the ES potential provided by the NH at a national level can be combined with the landscape units from the traditional landscape classification schemes to produce various spatial and statistical metrics that reveal how the national system of protected areas coincides with the areas of high ES conservation value.

Keywords: Bulgaria, digitization, GIS, landscape classification, landscape heterogeneity, mapping, nature conservation, spatial data

3. How to define priority areas for providing forest ecosystem services (FES): a novel approach for the spatially explicit assessment of FES

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Defining priority areas for promoting desired ecosystem services by adapted management activities is crucial for operationalisation of multi-valued management. In the frame of the IFORPLAN (ForestValue2) project, a novel approach for the assessment of forest ecosystem services (FES) and defining priority areas for selected FES at landscape and regional spatial scale was developed. The method was created by researches from four countries (Estonia, Finland, Poland and Slovenia) and their study regions. The procedure considers both potential (the capacity of a forest landscape to provide FES, regardless of currently utilization) and demand (the need for specific FES by society, stakeholder groups or individuals). The procedure

comprises three steps: i) defining spatially explicit indicators for FES potential and demand separately; ii) weighting each indicator using multi-criteria decision analysis with the fuzzy Best-Worst Method, which incorporates national experts' preferences; iii) mapping (i.e. creating detail GIS comprising layers of all indicators using grid of a 10 x 10 m) and defining priority areas that reflect synergies and trade-offs between FES. The research initiative was focused on three main FES: timber production, recreation, nature conservation. The set of indicators was developed (29 altogether), and weights for selected indicators were defined by experts in a participatory manner in each of participating country. Significant differences in weighted indicators were found between countries, driven by ecological conditions, cultural values and governance frameworks. The novel approach provides a holistic and robust framework for FES assessment and defining priority areas as a basis to guide harmonized forest management that provides desired FES. The procedure, the list of spatially explicit indicators, and examples of priority areas of FES potential and demand will be presented and discussed.

Keywords: Priority area, multi-functional forestry, potential, demand, indicator