

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: T1


Harnessing Integrated Ecosystem Assessments and Transdisciplinary Tools for a nature- and people-positive Europe

Hosts:

	Name	Organisation	E-mail
Host (s):	Joana Seguin	Leibniz University Hannover, Institute of Earth System Sciences, Physical Geography and Landscape Ecology	seguin@phygeo.uni-hannover.de
	Sofia Corticeiro	CESAM, Department of Environment and Planning, University of Aveiro	sofiacorticeiro@ua.pt
Co-host(s):	Sabine Lange	Leibniz University Hannover, Institute of Earth System Sciences, Physical Geography and Landscape Ecology	lange@phygeo.uni-hannover.de
	Benjamin Burkhard	Leibniz University Hannover, Institute of Earth System Sciences, Physical Geography and Landscape Ecology	burkhard@phygeo.uni-hannover.de
	Cláudia Carvalho Santos	University of Minho	c.carvalho.santos@bio.uminho.pt
	Mariana Almeida	CESAM, Department of Environment and Planning, University of Aveiro	mariana@ua.pt
	Helena Vieira	CESAM, Department of Environment and Planning, University of Aveiro	helena.vieira@ua.pt

Abstract:

In today's complex world, it is essential to adopt comprehensive and integrative approaches to ecosystem assessment and management to ensure a sustainable future for humans and nature. This session focuses on the synergies between Integrated Ecosystem Assessments (IEAs) and transdisciplinary tools for the assessment and valuation of ecosystem services. This combination provides a robust methodology to understand, analyse and promote the complex interactions between society and natural environments, promoting the uptake for better decision-making.



IEAs offer a holistic perspective by integrating ecological, economic, and socio-cultural dimensions to create a coherent picture of ecosystem dynamics. Additionally, IEAs often focus on integrating data related to ecosystem types, conditions, and services, offering a structured framework to better understand and assess the health and functionality of ecosystems as well as the services and the benefits they provide. Beyond these typical forms, integration in IEAs can also take several transformative routes. These include harmonizing diverse methodologies, indicators, and data sources to produce robust and reliable assessments and incorporating a wide spectrum of values (such as monetary, non-monetary, social-cultural, biophysical, intrinsic, instrumental, and relational aspects).

Simultaneously, transdisciplinary tools play a crucial role in bridging scientific knowledge about biophysical, economic and social values with policy- and decision-making needs. Tools such as ecosystem accounting frameworks, decision-support systems (DSS), participatory GIS, multi-criteria analysis, scenario-building, dynamic or agent-based modeling, serious games, living labs, and digital platforms enable the integration of multiple perspectives and value dimensions into ecosystem service assessment and valuation. These tools can be particularly relevant considering emerging policy frameworks such as the EU Nature Restoration Law, the Roadmap for nature credits, and strategies for reducing the externalized impacts of Europe through interregional flows of goods, resources, and ecosystem services.

This session aims to showcase both innovative conceptual advances and practical case studies to promote the integration of ecosystem assessments through transdisciplinary methods and demonstrate how they can contribute to the development of innovative policy- and decision-making instruments. In addition, we will focus on exploring opportunities for embedding transdisciplinary tools into sustainable finance mechanisms that support ecosystem restoration and long-term sustainability. Together, we strive for a nature- and people-positive Europe, grounded in a solid understanding and comprehensive valuation of ecosystem services.

Goals and objectives of the session:

- Promote knowledge on integrated ecosystem assessments and the use of transdisciplinary tools for comprehensive ecosystem assessments in Europe
- Discuss practical and policy applications of IEAs and transdisciplinary methodologies, especially in light of emerging policy frameworks like the EU Nature Restoration Law.
- Exchange innovative methods and concepts that support the sustainable management and financing of ecosystem services.

This session calls for contributions that present cutting-edge conceptual advances, innovative methodologies, and illustrative applied cases of integrated ecosystem assessments. They may consider how ecological, economic, and social knowledge can be combined, how information on ecosystem type, condition, and services can be linked with diverse methods and data sources, and how diverse values of nature can be incorporated into assessments.

We aim to showcase exemplary practices, identify common challenges, and inspire new approaches that align with sustainability goals and enhance the policy relevance of ecosystem assessments notably for the private and finance sector. By exploring these dimensions, the session seeks to empower stakeholders and foster a nature- and people-positive Europe through effectively integrating diverse perspectives and knowledge bases.

Planned output / Deliverables:

The session will generate a short, written summary of one to two pages, highlighting the main insights, promising approaches and identified opportunities for integrated ecosystem assessments and transdisciplinary tools as well as common challenges. Slides and abstracts from the presentations will be compiled and shared with the participants as a reference resource, and a mailing list or contact sheet will be created to support continued exchange among presenters and attendees. If the presentations are found to be sufficiently relevant and complementary, the session outcomes may also be developed into a joint opinion paper or a policy brief for wider dissemination.

Session format:

A mix of concise presentations/case studies (10 min each) selected through an open call for abstracts, showcasing innovative applications from different European contexts.

An interactive panel discussion to stimulate exchange across academic, policy, and practice perspectives moderated by one of the hosts (30 min).

Conclusions (10 min): Wrap-up by the moderator, summarizing key insights and outlining the preparation of a joint synthesis or opinion paper as a session output

Related to ESP Working Group:

TWG 1 – ES Assessment frameworks & Typologies

II. SESSION PROGRAM

Room: A3

Date of session: Tuesday, 19 May 2026

Time of session: 14:00 – 17:30

Timetable speakers:

Time	First name	Surname	Organization	Title of presentation
14:00 – 14:15	Sabine	Lange	Leibniz University Hannover, Germany	Supporting evidence-based decision-making: The Framework for Integrated Ecosystem Assessment (FIEA)
14:15 – 14:30	Veronika	Strauss	Leibniz Centre for Agricultural Landscape Research (ZALF), Germany	From Outputs to Interdependencies: Integrating Ecosystem Service Networks and Agroecological Perspectives for Sustainability-Oriented Assessments
14:30 – 14:45	Ethan	Mackereth	Adelaide University, Australia	Assessing the spatio-temporal variability of erosion with a novel wind erosion model and GIS: A case-study of the South Australian agricultural zone
14:45 – 15:00	Nils	Barthel	Leibniz University Hannover, Germany	The Potential of Complex Artificial Neural Networks for Species Distribution Modelling
15:00 – 15:15	Darragh	Corcoran	University of Galway, Ireland	How mapping granularity and typology choice reshape national marine ecosystem service assessments
15:15 – 16:00				Coffee break
16:00 – 16:15	Xianjie	Pan	University of Aberdeen, Aberdeen, UK & Huazhong Agricultural University, China	Reading the Landscape: Exploring Cultural Ecosystem Services in Loch Lomond & The Trossachs National Park Using Crowdsourced Texts
16:15 – 16:30	Meng	Li	Leiden University, The Netherlands	Assessing the multifunctionality of urban nature-based solutions: fine-scale evidence from The Hague
16:30 – 16:45	Tobias	Möllney	Institute for Ecological Economy	Urban Green Spaces Assessment Tool – Modelling Ecosystem Service Impacts of Urban Greening Scenarios

			Research (IÖW), Germany	for Planning, Decision-making and Communication
16:45 – 17:00	Sigvard	Bast	KTH Royal Institute of Technology, Sweden	Digital tools to support ecosystem services and biodiversity in spatial and urban planning
17:00 – 17:25				Discussion
17:25 – 17:30				Closing remarks

III. ABSTRACTS

The first author is the presenting author unless indicated otherwise

1. Supporting evidence-based decision-making: The Framework for Integrated Ecosystem Assessment (FIEA)

First author: Sabine Lange

Affiliation: Leibniz University Hannover

Contact: lange@phygeo.uni-hannover.de

A number of ecosystem assessment frameworks provide valuable insights into, and guidelines for, ecosystem assessments. While these perspectives provide valuable insights, some critical challenges persist: The existing approaches often adopt a siloed perspective, addressing ecosystem assessments primarily from the perspective of specific domains such as the sciences (e.g., the MAES Framework), the public or private sector (e.g., the Natural Capital Protocol), or with a focus on specific contexts (e.g., the Integrated Approach to Planning). They lack the integrated approach necessary to address the multifaceted nature of ecosystem assessments across diverse domains and contexts. Others bring together perspectives from various sectors but stay at a conceptual level (e.g., the IPBES 5-step valuation Framework), without specifying detailed steps and processes required for operationalisation. This fragmentation presents a barrier to achieving holistic and sustainable integrated ecosystem assessment outcomes that account for diverse user needs and relevant interdependencies among ecosystem components. The Framework for Integrated Ecosystem Assessments (FIEA) developed by the SELINA project (Science for Evidence-based and Sustainable Decisions about Natural Capital) offers a unified structure that builds upon and refines the existing assessment approaches to facilitate integrated ecosystem assessments and inform evidence-based decision-making across multiple sectors. Developed through an interactive co-creation process within the SELINA project, the FIEA engaged a wide range of partners, including scientists, policymakers, and private sector representatives, and is designed to be modular and flexible, catering to diverse needs and contexts. The framework encompasses six interconnected phases - Frame, Scope, Design, Assess, Share, and Act. It addresses present challenges that limit the uptake of ecosystem information in decision-making by enhancing transparency, stakeholder engagement, and adaptability. Within the presentation the FIEA's structure and development process will be addressed, underscoring its potential to bridge the gap between ecosystem science and practical decision-making.

Keywords: integration, ecosystem condition, ecosystem services, science-policy interface, IPBES


2. From Outputs to Interdependencies: Integrating Ecosystem Service Networks and Agroecological Perspectives for Sustainability-Oriented Assessments

First author: Veronika Strauss

Affiliation: Leibniz Centre for Agricultural Landscape Research

Contact: veronika.strauss@zalf.de

Integrated ecosystem assessments increasingly aim to support sustainability transitions, yet ecosystem services (ES) are still commonly analyzed and valued as discrete entities. This fragmented perspective



often neglects interdependencies and feedbacks among services and risks prioritizing tangible, end-of-cascade outputs—such as food provisioning—over those services that are essential for sustaining ecological functions, social relations, and long-term system resilience. Such assessment practices may therefore unintentionally reinforce short-term decision-making rather than enable systemic change. This talk argues for an integrated ecosystem service assessment approach that conceptualizes ES as an interdependent network rather than a linear cascade or checklist of services. Making these interrelations explicit can help identify ecosystem services that stabilize and reproduce the system as a whole, instead of implicitly treating all services as equally important or favoring those that are easiest to measure. Methodologically, the contribution presents work in progress on a participatory, transdisciplinary survey approach in which stakeholders and citizens collaboratively map interrelations between ecosystem services, assess their strength, and indicate positive or negative influences. The resulting data are used to construct an ecosystem service interdependency network that can serve as a transparent, stakeholder-informed foundation for future modelling and scenario analysis, supporting decision-making across scales.

To provide normative orientation for integrated assessments, the talk embeds this network-based ES approach within a broader agroecological framework. Linking ecosystem services to the Gliessman levels of agroecological transformation reveals a systematic mismatch: ecosystem services typically prioritized in valuation exercises are largely associated with lower transformation levels, whereas higher levels depend strongly on cultural ecosystem services related to values, norms, social relations, fairness, and care. These dimensions, while critical for sustainability transitions, are often underrepresented in conventional assessment tools.

By combining participatory ecosystem service networks with agroecological perspectives, this contribution demonstrates how integrated ecosystem assessments can better capture systemic dependencies and support more robust, just, and transformation-oriented sustainability decision-making.

Keywords: Agroecology, participatory methods, sustainability transition, ecosystem service interdependencies, integrated ecosystem service assessment

3. Private Lands for Public Good - Forest Owners and Biodiversity Conservation in Finland's METSO Program

First author: Henna Ekström Pigot

Other author(s): Mohamed Byari, Nils Droste, Mark Brady, Yann Clough

Affiliation: Department of Political Science/Earth and Environmental Sciences, Lund University

Contact: hanna.ekstrom_pigot@svet.lu.se

Traditionally, biodiversity conservation has been allocated to publicly owned land through formally protected areas, which are often biased toward landscapes of lower value for commercial production. Additionally, the implementation of strictly protected areas has exacerbated existing conflicts over land use. In light of the EU Nature Restoration Law, these existing tensions and the continuous need for increased focus on biodiversity protection have called for new modes of forest governance. One example is the Finnish biodiversity program, METSO, in which state and non-state actors agreed on a voluntary environmental protection policy. This policy has gained widespread acceptance among private forest owners with diverse values and needs and could inspire similar policy incentives. However, this requires a better understanding of how the policy's social, institutional, and ecological mechanisms interact. This study aims to improve understanding of these driving mechanisms using a social-ecological agent-based model. The results demonstrate the role of social dynamics in biodiversity conservation and their interactions with ecological processes. These interactions appear to have resulted in an emerging pattern of increased connectivity among protected areas. The study advances agent-based modeling by calibrating patterns of policy uptake. Using a spatial and social-ecological model, the analysis highlights the importance of integrative policy analysis that takes diverse values in policy implementation into account and provide valuable insights into discussions about social-ecological dynamics in biodiversity protection.

Keywords: forest policy, social-ecological, payment for ecosystem services, agent-based model

4. Assessing the spatio-temporal variability of erosion with a novel wind erosion model and GIS: A case-study of the South Australian agricultural zone

First author: Ethan Mackereth

Other author(s): Amelie Jeanneau, Tim Herrmann, Bertram Ostendorf

Affiliation: Adelaide University

Contact: ethan.mackereth@adelaide.edu.au

Wind erosion is a natural process of soil movement driven by dry conditions, high wind speeds and low ground cover. Soil loss due to wind erosion can be exacerbated by anthropogenic activities and presents major costs to agricultural productivity, human health, and infrastructure. With hotter and dryer conditions forecasted due to the impacts of climate change, soil loss due to wind erosion is likely to increase in magnitude and extent. Thus, the availability of tools to assess the magnitude and spatio-temporal extent of wind erosion is crucial to informing policymakers and land managers.

We used publicly available, long term, high spatio-temporal resolution data to develop a comprehensive process-based model of hourly horizontal soil sediment flux in regional South Australia. This approach allows us to assess wind erosion across varying land uses and management practices. Outputs from our model show the impact of varying climatic conditions on the magnitude and extent of wind erosion. Significantly we are able to see the impact on wind erosion of dry conditions during the Australian "Millennium drought" (2001-2010). The model shows that surface wind erosion is generally higher in agricultural areas than in natural environments. Within the agricultural areas, the magnitude of wind erosion can be reduced by land management practices that improve ground cover.

Our model presents a tool for quantifying the magnitude and extent of wind erosion across varying land uses and management practices, offering a pathway to quantify ecosystem services associated with mitigating wind erosion in both natural and agricultural systems.

Keywords: Wind Erosion, Soil Security, Spatio-Temporal Modelling, Big Data, Land Management Practices

5. The Potential of Complex Artificial Neural Networks for Species Distribution Modelling


First author: Nils Barthel

Other author(s): Jakob Fahr, Benjamin Burkhard

Affiliation: Leibniz University Hannover, Institute for Earth System Sciences, Physical Geography and Landscape Ecology, Schneiderberg 50, Hannover, 30167, Lower Saxony, Germany

Contact: barthel@phygeo.uni-hannover.de

Assessing the relationship between endangered species and the environmental conditions of their known habitats is essential for identifying potential habitats and prioritizing ecological restoration efforts. In the context of the EU Nature Restoration Regulation, responsible authorities require spatially explicit information to guide restoration and conservation measures for endangered species. Species Distribution Models (SDMs) provide a quantitative framework for deriving this spatial information and assessing relationships between past, current, and potential habitat suitability and underlying ecosystem conditions. Our study aims to achieve this by applying a range of SDMs to endangered reptile and amphibian species, including established approaches such as MaxEnt and novel machine learning methods, utilising artificial neural networks of varying complexity. We combined known occurrences of endangered reptile and amphibian species in Lower Saxony, Germany, with environmental predictors derived from satellite remote sensing data and bioclimatic variables. We then evaluated how model complexity and the spatial resolution of these predictors influence predictive performance by comparing Area Under the Curve (AUC) values. Our results indicate that highly complex models, including deep neural networks (AUC = 0.909), outperform simpler established models such as MaxEnt (AUC = 0.843) on independent test data. Increasing the spatial resolution from 1000 m to 100 m substantially improved model performance across all approaches. Permutation importance analysis identified elevation, moisture indices, and short-wave infrared reflectance as key predictors. Overall, these findings highlight the potential of high-resolution environmental data combined with advanced neural network models to support evidence-based conservation planning, including habitat identification, restoration, and improving habitat connectivity.



Keywords: Artificial Intelligence, Habitat Restoration, Biodiversity, Deep Learning, Long-Term Monitoring

6. How mapping granularity and typology choice reshape national marine ecosystem service assessments

First author: Darragh Corcoran

Other author(s): Stephen, Hynes, Luke, McGrath, Jenny, O'Leary, Nova, Sharkey

Affiliation: University of Galway, Marine Institute, Central Statistics Office

Contact: D.Corcoran7@universityofgalway.ie

Robust marine ecosystem service assessments require spatial inputs that correctly represent ecological heterogeneity. Yet national-scale mapping often relies on coarse, harmonised typologies or generalised seabed maps. Little work has quantified how mapping resolution and typology choice alter downstream ecosystem service estimates and their economic interpretation for policy. This study quantifies how alternative ecosystem extent baselines and typology choices, using a high-resolution compiled map versus an EUSeaMap-derived baseline, systematically change national and class-level carbon sequestration and fish provisioning values in SEEA EA-style accounts using controlled valuation inputs, Monte Carlo uncertainty propagation, and formal statistical comparisons.

Results show that more detailed ecosystem typologies preserve fine-scale ecological variation with direct implications for ecosystem service valuation and spatially explicit economic assessment. At 1 hectare resolution, raised seabed structures, submarine canyons, and coarse sediment systems are resolved as distinct ecosystem types, increasing their mapped extent and, given their literature-based sequestration coefficients, their contribution to national carbon sequestration estimates. When the same spatial data are expressed using a more aggregated ecosystem classification, these contrasts are substantially dampened and, in some cases, reversed, demonstrating that typological aggregation can mask carbon-dense habitats and invert comparative rankings between mapping approaches. For fish provisioning, where biophysical values are held constant by design, differences arise solely from changes in ecosystem attribution: map generalisation reallocates large areas between ecosystem types, producing divergent spatial patterns of estimated provisioning potential that would materially affect integrated ecosystem assessments and spatial planning decisions.

The results establish that mapping resolution and typology selection are not interchangeable technical choices but key determinants of ecosystem service outcomes and their economic relevance for spatial planning. The study provides an operational, fully reproducible mapping framework that supports integrated ecosystem assessments and strengthens the evidence base for marine spatial planning and emerging marine ecosystem accounts.

Keywords: ecosystem accounting, ecosystem services, marine mapping, spatial resolution, ecosystem typology

7. Reading the Landscape: Exploring Cultural Ecosystem Services in Loch Lomond & The Trossachs National Park Using Crowdsourced Texts


First author: Xianjie Pan

Other author(s): Ross Purves, Flurina M. Wartmann

Affiliation: Geography and Environment, School of Geosciences, University of Aberdeen, Aberdeen, UK; Department of Landscape Architecture, School of Horticulture & Forestry Sciences, Huazhong Agricultural University, Wuhan, People's Republic of China

Contact: x.pan1.25@abdn.ac.uk

Cultural Ecosystem Services (CES) play a central role in the management of UK National Parks, which are historically conceived as lived-in, working cultural landscapes. As a case study, we use the Loch Lomond & The Trossachs National Park. Established in 2002 as Scotland's first national park, it represents a multifunctional landscape that includes lochs, mountains, forests, farmland, and settlements. This landscape diversity supports a wide range of cultural ecosystem services including recreation, wellbeing, identity, and heritage both for residents and visitors. Despite the recognised importance of CES, they remain difficult for national park and other management authorities to operationalise and assess in



practice, particularly using scalable and empirically grounded methods.

This study explores how user-generated texts from the public can be used to identify and analyse CES within a protected area context.

We use georeferenced descriptions from Geograph.UK, an established citizen science platform documenting the British landscape with texts and pictures, to capture public perceptions and place-based experiences. A natural language processing (NLP) pipeline is developed to extract CES expressions from unstructured text on Geograph.UK, focusing on categories including aesthetics, recreation, wilderness, tranquillity and cultural heritage. The analysis proceeds in three stages. First, we demonstrate how CES can be extracted from crowdsourced textual descriptions. Second, we examine the relative importance and spatial distribution of different CES, identify areas where specific CES were perceived and expressed more frequently. Third, we explore how CES expressions co-occur with references to landscape features (e.g. lakes, mountains, vegetation), providing insights into how physical landscape elements shape perceived CES.

The results highlight the potential of crowdsourced text to reveal place-based CES patterns that are difficult to capture cost-effectively through traditional survey-based methods. Methodologically, the study demonstrates a transferable approach for CES extraction from user-generated content. Practically, it offers implications for national park management, illustrating how landscape experiences expressed through user-generated data can provide evidence for decision-making in landscape management.

Keywords: cultural ecosystem services, user-generated content, natural language processing, protected areas

8. Assessing the multifunctionality of urban nature-based solutions: fine-scale evidence from The Hague

First author: Meng Li

Other author(s): Roy P. Remme, Peter M. van Bodegom, Joeri Morpurgo, Jie Hu, Alexander P.E. van Oudenhoven

Affiliation: Institute of Environmental Sciences CML, Leiden University, Einsteinweg 2, 2333 CC Leiden, The Netherlands

Contact: m.li@cml.leidenuniv.nl

Urban nature-based solutions (NbS) are increasingly promoted for their capacity to simultaneously deliver multiple benefits for biodiversity and human well-being (i.e., multifunctionality). Urban NbS encompass a wide range of types, including parks, street trees, gardens, and forests, whose heterogeneous characteristics shape their potential to provide multiple benefits. However, empirical field-based evidence on NbS multifunctionality remains limited, particularly at fine spatial scales relevant for urban planning and management. Our research assesses NbS multifunctionality across four common NbS types, namely natural parks, semi-natural parks, residential green spaces, and roadside green spaces, based on 110 sites in The Hague, the Netherlands. Multifunctionality is operationalized using six indicators, derived from integrated multi-source data that combines field-based environmental measurements, biodiversity observation data, and crowd-sourced activity data, capturing key benefits for both biodiversity and people: air purification, microclimate regulation, stormwater regulation, invertebrate biodiversity, bird biodiversity, and physical activity. The results show significant differences among NbS types for several individual benefits, including bird biodiversity, air purification, and physical activity, as well as contrasting patterns of synergies and trade-offs among these benefits. In addition, NbS types exhibit distinct multifunctionality profiles, but observed differences are sensitive to methodological choices used to calculate the integrative multifunctionality metric, underscoring the importance of indicator selection and integration. By assessing multifunctionality through multiple empirically measured indicators and explicitly accounting for NbS type, our research provides a decision-relevant evidence base at fine spatial scales, supporting evidence-informed urban NbS planning and management in real-world contexts.

Keywords: nature-based solutions, multifunctionality, integrated ecosystem assessment, multi-source data integration, urban biodiversity

9. Urban Green Spaces Assessment Tool – Modelling Ecosystem Service Impacts of Urban Greening Scenarios for Planning, Decision-making and Communication

First author: Tobias Möllney

Other author(s): Jesko Hirschfeld, Tarin Karzai, Josephin Wagner, Claudia Hornberg, Michaela Liebig-Gonglach, Julius Freymüller, Hannah-Lea Schmid, Martha Kogler

Affiliation: Institute for Ecological Economy Research (IÖW)

Contact: tobias.moellney@ioew.de

The project series “Value of Green Urban Spaces I-III” has produced the “Urban Green Assessment Tool” which allows the interactive valuation of ecosystem service impacts of city-wide greening scenarios to inform decision-making and facilitate communication. Currently, version 1 is available for the 23 largest German cities (<https://www.stadtgruen-wertschaetzen.de> – only available in German).

The tool permits modelling of freely adjustable scenarios, i.a. by varying the amount of green spaces, street trees, and green roofs. An interactive map shows the resulting spatial distribution of biophysical and monetary benefits from increased greening or losses from reduced urban greenery across the city. The ecosystem services valued are: rainwater retention, reduction of air pollution, carbon sequestration, temperature regulation, and cultural services. The tool combines a wide range of approaches to quantify these services (i.a. damage cost, replacement cost, work productivity loss, WTP from discrete choice experiment) and datasets (i.a. Copernicus land use data, geolocated census data, specifically conducted nationwide representative surveys).

The easy-to-use and freely accessible web platform was developed in transdisciplinary cooperation with partner cities to address the needs of municipal administrations. It can inform prioritization of measures and development of informal planning instruments such as urban action plans. It further allows modelling the impacts of legislation, e.g. climate adaptation laws or the EU Nature Restoration Regulation. In these contexts, the tool facilitates communication between policymakers, planners and the public by providing quick estimates of ecosystems service values.

Currently, version 2 of the tool is under development in an interdisciplinary team (environmental economics, health sciences, microclimate modelling) to implement significant improvements including: a) extension to the 193 largest German cities, b) more detailed microclimate modelling using standardized urban typologies, c) better health impact and work productivity assessment based i.a. on a nationwide representative survey, d) improvements in usability from user feedback.

Keywords: Urban Green, Interactive Ecosystem Service Valuation, Integrated Assessment Tool, Decision Support Tool, Municipal Climate Adaptation

10. Digital tools to support ecosystem services and biodiversity in spatial and urban planning

First author: Sigvard Bast

Other author(s): Ulla Mörtberg

Affiliation: KTH Royal Institute of Technology, Stockholm, Sweden

Contact: mortberg@kth.se

Sustainable urban development requires the integration of ecosystem services and biodiversity into spatial and urban planning. Achieving this requires the effective translation of scientific knowledge into planning practice, supported by suitable digital tools. These tools – including mapping systems, software, platforms, methods, and models – are intended to inform and embed green values into planning processes. However, the gap between scientific development and practical application remains a challenge.

This study aims to explore the effectiveness of ecosystem services science in informing urban planning decisions, and to identify main bottlenecks hindering the implementation of such knowledge in municipal planning contexts. The analysis is based on a literature review and focus group interviews with planners and officials from several municipalities in the Stockholm Region.

Findings indicate several key issues that limit the integration and impact of digital tools in green planning.



These include: lack of institutional mechanisms to ensure long-term use and relevance of tools; risk of "analysis paralysis" where tools generate ever more data without clear application in decision-making; vulnerability of tool-dependent knowledge to organisational changes; and concerns that digital tools may override or marginalise local knowledge and on-site assessments. Participants also highlighted the challenge of designing tools that bridge organisational silos and promote cross-departmental collaboration, without oversimplifying complex ecological realities.

The study concludes that while digital tools hold significant potential to support sustainable urban development, their effectiveness depends on thoughtful integration into institutional practices, continuity of knowledge, and careful balancing between technical outputs and experiential, place-based insights. Enhanced collaboration between researchers and practitioners is essential to ensure that tool development aligns with planning realities and long-term sustainability goals.

Keywords: Urban planning support, Digital models and tools, Knowledge integratio