BOOK OF ABSTRACTS

I. SESSION DESCRIPTION

ID: O3

Novel contributions to ecosystem service research - from early-career researcher perspectives

Hosts:

	Title	Name	Organisation	E-mail
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Abstract:

This session, organized by members of the Young Ecosystem Service Specialists (YESS) network, aims at sharing novel theoretical and practical approaches for ecosystem services (ES) assessments, including those addressing social participation.
ES frameworks have been gradually integrated into national management plans and regulatory frameworks to tackle local and global societal challenges such as climate change, disaster risk reduction, food security, and economic & social development. Despite the contributions of ES-based research emphasizing human dependence on ecosystems and closing gaps in the science and policy interface, stronger efforts are needed to match the urgency of the situation. Current global crises affect our connection to nature threatening socio-ecological systems through losses of biodiversity and ES. In this context, addressing current gaps and bottlenecks of ES research needs dialogues and open spaces to co-produce knowledge and generate new ideas. The perspective of early-career researchers (ECR) and peer-exchange are of special importance, as ECRs are the future generation of scientists.
This session, therefore, aims at sharing a diverse range of innovations in ecosystem services research and identifying potential research gaps, synergies, and opportunities for future collaborations. We encourage abstracts from ECRs that present novel theoretical and methodological approaches and case study examples about (the ideas include but are not restricted to) (i) novel methods or improvements of ES assessment and ES accounting; (ii) social participation and participatory processes in ES research; (iii) human-nature connectedness to ES; and (iv) ecosystem-based approaches to tackle global crises and societal challenges.
This session will follow a flexible format of presentations and speed talks closing the session with a world café. There will be the possibility to join the session virtually as well as in person.

Goals and objectives of the session:

Offering a space for YESS - ECR to share and discuss insights to overcome current challenges in ES-based research. This will be an opportunity for ECR to connect, participate and build the scientific community.

Planned output / Deliverables:

Synthesis report of the session to be published within the YESS network (e.g. through the newsletter) about novel contributions carried out by ECR to ES research. Potentially a scientific article, depending on the quality of the session outcomes and the availability of the participants. Strengthening the YESS network through peer-learning activities.

Session format:

Mix of standard session - with speed talks (50%) and a world café (50%)

Voluntary contributions accepted:

Yes, I allow any abstract to be submitted to my session for review

Related to ESP Working Group/National Network:

Young ES Specialists (YESS)

II. SESSION PROGRAM

Date of session: October 14, 2022
Time of session: 11:00–12:30 & 13:30–15:30

Timetable speakers (Part 1)

Time	First name	Surname	Organization	Title of presentation
11:05–11:12	Sophie	Bretagnolle	UQAM – Sorbonne Université	Ecosystem services as a normative frame for ecosystems functioning
11:12–11:19	Patricia	Santillán-Carvantes	Leuphana University	Quality of life in social-ecological system units: Evidence from a global south case study
11:19–11:26	Laura	Maebe	University of Liège	How to navigate toward sustainability? An ecosystem services and resilience operational framework
11:26–11:33	Myriam	Perschke	Nelson Mandela University	Ecological Infrastructure as an ecosystem-centered framework for comprehensive coastal ecosystem services mapping in the context of systematic conservation planning
11:33–11:40	Uzma	Saeed	Quaid e Azam University	Analysis of provisioning ecosystem services and perceptions of climate change for indigenous communities in the Western Himalayan Gurez Valley, Pakistan
11:40–11:47	Vince	van 't Hoff	Foundation for Sustainable Development	Make nature count: Ecosystem services in the ASN Biodiversity Fund

For the remaining time: World Café (Part 1)

Timetable speakers (Part 2)

Time	First name	Surname	Organization	Title of presentation
13:35–13:42	Swantje	Gebhardt	Utrecht University	How does agricultural intensity affect ecosystem services? Informing spatial planning of rural landscapes
13:42–13:49	Roxanne Suzette	Lorilla	National Observatory Athens (NOA)	Earth observation and machine learning for assessing drivers of ecosystem services in agricultural landscapes
13:49–13:56	Sophie	Meier	Leibniz Institute of Ecological Urban and Regional Development	Predicting wild bee habitat and pollination service from landscape features
13:56–14:03	David	Bennett	Christian Albrechts Universitat zu Kiel	Effect of semi-natural habitat and habitat fragmentation on pollinators at wildflower compensation areas in Schleswig Holstein, Germany
			5 min break	
14:08–14:15	Geanderson	Ambrósio	Instituto Nacional de Pesquisas Espaciais, São José dos Campos	Beyond carbon: the contribution of South America tropical humid and sub-humid forests to ecosystem services
14:15–14:22	Alice	Stocco	Ca' Foscari University, Venice	Bringing together ecology and paleontology to assess multi-temporal Ecosystem Services: a new opportunity for young researchers?
14:22–14:29	Marek	Hekrle	Jan Evangelista Purkyně University in Ústí nad Labem	Communicating nature-based solutions to residents: how people want to be informed about measure implementation in Czechia
14:29–14:36	Jose	Chapa	Leibniz University Hannover	Implementation of Green Infrastructure as a prototype in urban Costa Rica

For the remaining time: World Café (Part 2)

III. ABSTRACTS

Abstracts are ordered based on the session program. The first author is the presenting author unless indicated otherwise.

1. *Type of submission: Abstract*

O. Other sessions: O3 - Novel contributions to ecosystem service research - from early-career researcher perspectives

How does agricultural intensity affect ecosystem services? Informing spatial planning of rural landscapes

Presenting author: Swantje Gebhardt
Other author(s): Julia Camara de Assis
Affiliation: , Netherlands
Contact: s.gebhardt@uu.nl

Agricultural intensification – in terms of practices like increased use of fertilizer, pesticides or tillage – as well as the simplification of landscapes, have enhanced productivity, but also led to enormous environmental problems such as eutrophication and biodiversity loss, with consequences for ecosystem services provision. Hence, a transition to a sustainable agricultural system that reconciles conflicting land demands for agricultural output and ecosystem services is necessary. In the Netherlands, visions for such a transition include new forms of agriculture as well as nature-based changes in the landscape layout. However, the scientific understanding of how ecosystem services respond to different agricultural practices in connection to land use arrangement settings is not complete. We address this gap by systematically exploring the interactions of an agricultural management intensity indicator with spatial composition and configuration metrics with regards to their effect on different ecosystem services using regression models. Our findings suggest that with lower intensity, a desirable performance of services like pollination, can be achieved even in sites dominated by agricultural fields. In other cases, the performance of landscape appreciation as a cultural service is affected by land use diversity regardless of the agricultural intensity in the surroundings. For water quality related services, a good performance can be sustained under higher intensity if enough patches of absorbing natural land uses are around. This exploratory analysis generates insights on important spatial relationships in the Dutch landscape. We also identified challenges in defining intensity due the wide variety of management practices from distinct agricultural sectors that influence ecosystem services differently. Such definition plays a fundamental role in research development, especially for the communication with stakeholders on potential scenarios resulting from different agriculture types distributed in the landscape. To enhance the usability of produced knowledge, the intensity indicators need to match the practice conditions and problems.

Keywords: Agricultural intensity, Interaction, Landscape metrics, Spatial planning, Ecosystem service

2. Type of submission: Abstract

O. Other sessions: O3 - Novel contributions to ecosystem service research - from early-career researcher perspectives

Predicting wild bee habitat and pollination service from landscape features

Presenting author: Sophie Meier

Affiliation: Leibniz-Institut of Ecological Urban and Regional Development, Germany

Contact: s.meier@ioer.de

Pollinators are important to maintain our food security, as they pollinate various crops such as legumes and fruits. Similarly, they are crucial to maintain trophic chains by pollinating wild plants which supply food for other animals. To maintain pollination services, wild bees need, e.g. semi-natural areas, undisturbed edge habitats, and extensive grasslands, where they can nest and find pollen and nectar. However, these living spaces decrease in Germany due to intensive agricultural practices where small-scale landscapes are converted to simplified landscapes for a more efficient cultivation of crops. Therefore, it is crucial to identify areas that can be improved by increasing the number of appropriate flowering plants

The potential of the landscape types to host wild bees and enable pollination services has been estimated and mapped on the EU level by Zulian et al. (2013). In this study, experts ranked different land use and land cover types regarding their capacity to provide nesting spaces and flowering plants for wild bees. This approach has been transferred to higher resolved land cover and land use data of Germany. However, the model still shows considerable inaccuracies.

The presentation will show a conceptual approach of how the expert-based model will be evaluated and further developed. Firstly, a meta-analysis is conducted which sets the expert-based ranking of landscape types for wild bees in relation to a literature review of wild bee habitat studies. Subsequently, the expert-based model is validated using wild bee field samplings and high-resolution landscape data of for example open soil, mowing and fertilizing intensity of grassland and altitude. Finally, the supply of the pollination potential for crops is analyzed by considering the distance between pollination dependent crops and wild bee habitat. Also, the effect of new semi-natural habitat on the pollination potential will be simulated by splitting crop fields with potential hedges.

Keywords: Semi-natural elements, insect decline, crop pollination, habitat restoration

3.Type of submission: Abstract

O. Other sessions: O3 - Novel contributions to ecosystem service research - from early-career researcher perspectives

Communicating nature-based solutions to residents: how people want to be informed about measure implementation in Czechia.

Presenting author: Marek Hekrle

Other author(s): Jan Macháč

Contact: marek.hekrle@ujep.cz

Issues such as adaptation to climate change in cities or provision of sufficient space for urban recreation in relation to the COVID-19 pandemic could be partly solved by implementation of nature-based solutions (NBS), which provide a wide range of ecosystem

services (ES). Despite a significant increase in implementation of NBS in recent years, municipalities' long-term efforts continue to face low interest and support from residents. Due to the limited resources city representatives prefer implementation of frequently demanded public services such as education, social services and health care. Effective communication is therefore one of the key success factors in the whole process of raising the support for most of the NBS-related policy decisions.

The contribution will present the results of a survey that explored residents´ preferences towards the intensity and forms of communication at different stages of the NBS implementation processes and attitudes towards individual ES. Data were collected through face-to-face questionnaire surveys with residents of two medium-sized Czech cities (20-50 thousand residents). The results show that residents perceived the need to be informed about the implementation of measures differently based on the type of the measure (e.g. great interest at all stages in the case of a park revitalisation vs. lower interest in the case of the implementation of a permeable car park) and based on the stage of measure implementation (the initial idea, planning, preparation and implementation phases, maintenance). There are also significant differences in perceptions of the importance of individual ES (cultural ES are perceived as the most important). For each NBS it is therefore advisable not only to set the appropriate form and timing of communication, but also to focus on the communication of cultural ES, which people perceive very important. The importance of other ES should be promoted within pilot projects to raise awareness about them.

Keywords: Nature-based solutions, ecosystem services, communication, participation, rainwater management

4.Type of submission: Abstract

O. Other sessions: O3 - Novel contributions to ecosystem service research - from early-career researcher perspectives

How to navigate toward sustainability? An ecosystem services and resilience operational framework

Presenting author: Laura Maebe
Other author(s): Hugues, Claessens
Affiliation: Gembloux Agro-Bio Tech, University of Liège, Belgium
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To address the current global crises threatening socio-ecological systems, we need to bring together the concepts of resilience and ES to define what we want to maintain and restore (i.e. the ES) in response to the actual and future changes (i.e. resilience).

Therefore, we propose a methodological framework combining these two concepts in a participatory way. This framework is currently applied to the municipal forest of Sivry-Rance (Belgium).

After delimiting the system, we organized a first participatory workshop to define the management scenarios. We first asked the participants their main wish and fear concerning the future of Sivry-Rance's forest and then to build together their dream forest. Six management scenarios were defined ranging from multifunctional forest to forests maximizing specific ES (e.g. wood production or recreation) coupled with two climate change scenarios.

Then, we assessed the different ES in their current condition and in the twelve scenarios, using a variety of methods (literature review, existing models, surveys, field data). We are currently analysing the impact of these alternatives on the different ES and the resilience of ES (i.e. how the levels of ES and their diversity fluctuate).

In a second participatory workshop, the stakeholders weighted and gave meaning to these values (e.g. what is the minimal value that a ES should have) in four groups. By applying these four types of preferences to the ES assessment, we plan to analyse the influence of varying societal demands on the selection of the best scenario(s), to study the social resilience.

Finally, a third participatory workshop will be organized this autumn to discuss the findings and co-generate an action plan for the Sivry-Rance's forest.

In conclusion, this framework offers an operational tool to navigate toward sustainability by assessing the socio-ecological system and its dynamics while integrating the different views of the stakeholders.

Keywords: Multi-criteria analysis, socio-ecological resilience, ES assessment, participatory process

5. *Type of submission: Abstract*

O. Other sessions: O3 - Novel contributions to ecosystem service research - from early-career researcher perspectives

Earth observation and machine learning for assessing drivers of ecosystem services in agricultural landscapes

Presenting author: Roxanne Suzette Lorilla
Other author(s): Vasileios Sitokonstantinou, Georgios Giannarakis, Charalampos Kontoes
Affiliation: National Observatory of Athens, Greece
Contact: rslorilla@noa.gr

It is widely recognized that agricultural landscapes, apart from delivering provisioning ecosystem services, have the potential to also deliver a broad set of other regulating and

cultural services, including pollination, erosion control, climate regulation and recreation. However, as the primary goal of the agricultural sector has been to produce agricultural products and raw materials, agricultural management has not particularly aimed at sustaining the production of non-provisioning ecosystem services. To address these issues, the Common Agricultural Policy (CAP), since its launching, envisioned the sustainable management of natural resources while supporting farmers and improving agricultural productivity. Yet, due to its policy measures being horizontally implemented, the CAP showcased limited effectiveness in mitigating the significant environmental impacts of intensive agricultural activities. In this context, the current study aims at identifying locally adaptive management measures for maintaining essential ecosystem services to enable effective decision-making and achieve sustainable and resilient agriculture. Using a typical European agricultural landscape as a study area, we employed a set of EO based indicators and machine learning methods to understand the patterns in ES, their drivers and local conditions that enhance or hinder their relationship. Taking into account the recently proposed list of agricultural practices that eco-schemes could support, we examine the contribution of a set of management measures (such as the establishment of grasslands, and agricultural landscape diversity) to ecosystem services. The results showed that the co-occurrence of multiple ecosystem services was subject to the different agricultural management measures and local environment-climate conditions. To that end, our approach showcases the need for decision-makers and farm managers to design flexible and adaptive measures that enable European farmers to contribute to the EU's climate and environment objectives in terms of social, environmental, and economic sustainability in agriculture rural areas.

Keywords: ecosystem services, drivers, machine learning, sustainable and resilient agriculture

6.Type of submission: Abstract

O. Other sessions: O3 - Novel contributions to ecosystem service research - from early-career researcher perspectives

Analysis of provisioning ecosystem services and perceptions of climate change for indigenous communities in the Western Himalayan Gurez Valley, Pakistan

Presenting author: Uzma Saeed
Other author(s): Muhammad Arshad
Affiliation: Quaid I Azam University, Pakistan
Contact: bretashlay@gmail.com

Climate change is a significant threat to people living in mountainous regions. It is essential to understand how montane communities currently depend especially on the provisioning ecosystem services (ES) and the ways in which climate change will impact these services, so

that people can develop relevant adaptation strategies. The ES in the Gurez Valley, in the Western Himalayas of Pakistan, provide a unique opportunity to explore these questions. This understudied area is increasingly exposed not only to climate change but also to the over exploitation of resources. Hence, this study aimed to (a) identify and value provisioning ES in the region; (b) delineate indigenous communities' reliance on ES based on valuation; and (c) measure the perceptions of indigenous communities of the impact of climate change on the ES in Gurez Valley. Semi-structured interviews and focus group discussions were used to classify the provisioning ES by using the 'Common International Classification on Ecosystem Services' (CICES) table and applying the 'Total Economic Valuation (TEV)' Framework. Results indicate that the indigenous communities are highly dependent on ES, worth 6730 ± 520 USD/Household (HH)/yr, and perceive climate change as a looming threat to water, crops, and rearing livestock ES in the Gurez Valley. The total economic value of the provisioning ES is 3.1 times higher than a household's average income. Medicinal plant collection is a significant source of revenue in the Valley for some households, i.e., worth 766 ± 134.8 USD/HH/yr. The benefits of the sustainable use of ES and of climate change adaptation and mitigation, are culturally, economically, and ecologically substantial for the Western Himalayans.

Keywords: Economic valuation, Provisioning ecosystem services, Climate change, Focus group discussion, Gurez Valley, Western Himalayas

7.Type of submission: Abstract

O. Other sessions: O3 - Novel contributions to ecosystem service research - from early-career researcher perspectives

Implementation of Green Infrastructure as a prototype in urban Costa Rica

Presenting author: Jose Chapa

Affiliation: Liebniz Universität Hannover, Germany

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Practitioners promoting novel nature-based solutions are challenged to contextualize the boundaries of such ideas to reality. Those contexts transcend disciplinary limits in urban areas because complexity increases by the interaction with governance, policy, and culture. This study reports the co-design of green infrastructure as a prototype, especially the dynamics expected during the early phases of its adoption for managing stormwater runoff control. The experiment follows a downscaling approach for the management of water systems in which participants define the most suitable location and function of the prototype, thereby revealing existing limitations and relations of power. A retention-infiltration system adapted to a rainfall collector outfall resulted in a collective agreement considering space availability, regulations, and social perceptions. Emergent dynamics during its construction reveal aspects initially ignored. Understanding the expected performance of the prototype was the first constraint to progressing the implementation. It

was solved by adapting land cover classification and hydrological modelling techniques. Another limitation refers to the normative procedures: the desire to avoid responsibility for the unknown and the divergence between hydrological-political boundaries hampered the participation of key actors, thereby reducing opportunities for pilot measures to abandoned parcels near riparian zones. On the other hand, adopting in the discourse the relevance of legal mandates for environmental protection at regional scales booster the cooperation between authorities and scientists. However, initial failures during the construction and the dependence of the experiment on constantly changing actors reduced the communication and acceptance of residents, increasing concerns and demands for conventional procedures. Being aware of potential scenarios based on the existing context support improving the resilience of similar experiences, especially when the retrofitting of urban spaces aims to empower citizens to promote new ecosystem services but remain dependent on specific views of Nature at the local scale.

Keywords: green infrastructure, prototype, urbanization, retrofitting, stormwater runoff

8.Type of submission: Abstract

O. Other sessions: O3 - Novel contributions to ecosystem service research - from early-career researcher perspectives

Ecological Infrastructure as an ecosystem-centered framework for comprehensive coastal ecosystem services mapping in the context of systematic conservation planning

Presenting author: Myriam Perschke
Other author(s): Dr Linda R. Harris
Affiliation: Nelson Mandela University, South Africa
Contact: m.perschke@posteo.de

Coastal ecosystems and associated ecosystem services are degrading rapidly in many areas and thus, require careful conservation and management. Nevertheless, few studies have integrated ecosystem services into systematic conservation planning (SCP). Strategies to map ecosystem services do exist, including the emerging ecosystem-centered Ecological Infrastructure (EI) framing. This study, conducted in South Africa, aimed to develop and apply a flexible (relevant to multiple contexts) and spatially accurate method to identify and comprehensively evaluate the importance of EI to society (EI performance). This was achieved by 1) using EI as a framework for mapping biodiversity-based ecosystem services, 2) evaluating the demand, flow, and capacity of the ecosystem services, and 3) using causal relationships to approximate EI performance. Three ecosystem services: nature-based sports events, nature-based recreational outdoor activities, and coastal protection from flooding and erosion were mapped separately and jointly. A high-resolution map of EI performance for all three services was produced, and EI sites with very high single- and multiple-service performance were identified. Overall, the spatial distribution of the EI demand, flow, capacity and performance was plausible. Sandy shore ecosystems demonstrated the highest potential

for multiple-service delivery. EI close to urban nodes emerged as the most important, and EI providing coastal protection was spread widely along the coast. The use of EI as a framework for ecosystem service mapping, in combination with the evaluation of all three ecosystem service aspects: demand, flow, and capacity, is a comprehensive and innovative method that is flexible. It should be further tested at different scales and in different spatial contexts.

Keywords: ecosystem services mapping; Ecological Infrastructure; systematic conservation planning

9.Type of submission: Abstract

O. Other sessions: O3 - Novel contributions to ecosystem service research - from early-career researcher perspectives

Ecosystem services as a normative frame for ecosystems functioning

Presenting author: Bretagnolle Sophie
Affiliation: UQAM - Sorbonne Université, Canada
Contact: sophie.bretagnolle@gmail.com

Ecosystem Services (ES) are commonly considered as a way to acknowledge a connection between human and nature (Díaz et al., 2015, 2018 ; Egarter Vigl et al., 2022 ; Millennium Ecosystem Assessment (Program), 2005). More precisely, this connection has a direction (from nature to human), is normative and anthropocentric. However, there is still ambiguities about the place and role that ES have in this connection. They can be considered different than benefits, and thus different to a product of ecosystems, but also often include being tangible goods that humans can consume (Díaz et al., 2018 ; Millennium Ecosystem Assessment (Program), 2005). They can be linked to ecosystem functioning but usually, it also means that the ES will excludes ecological functions or indirect ES (Haines-Young et Potschin, 2018) even though these services were initially one of the most important ones (see « life-support functions » in Daily, 1997). Altogether, these conceptualizations of human-nature connexion through ES often still fail to overcome three critical weaknesses. First of all, the ES concept often overlaps with other concepts such as “benefits” and “ecological functions”. Second, the link between ES and ecological functions is still unclear. Third, the representation of human-nature connection through ES often maintain the separation between human and nature (Boulangeat et al., 2022) which is incompatible with multiple local and indigenous systems of knowledge.

In this presentation, I will propose an understanding of the concept of ES as an independent framing the different processes that take place within ecosystems according to their effects (positive and negative) on humans. In this understanding, ES are not linked to ecological functions but are considered being functions of the ecosystems, overlaps between ES and EF are explained by their role of “life-support functions” and humans are placed at the centre of the ecosystem.

Keywords: Ecosystem Services, Philosophy of Science, Ecosystem functionning

10.Type of submission: Abstract

O. Other sessions: O3 - Novel contributions to ecosystem service research - from early-career researcher perspectives

Effect of semi-natural habitat and habitat fragmentation on pollinators at wildflower compensation areas in Schleswig Holstein, Germany.

Presenting author: David Bennett

Other author(s): Tim Diekoetter

Affiliation: Christian Albrecht's Universitat zu Kiel, Germany

Contact: dbennett@ecology.uni-kiel.de

Wildflower compensation areas (WCA) in agricultural ecosystems are becoming increasingly common methods to attempt to conserve wildlife in the landscape. However, little research has been done to determine what factors influence their effectiveness for insect conservation and ecosystem services.

In theory, the quantity of semi-natural habitat and the degree of habitat fragmentation may influence whether insects, including pollinators such as bees and hoverflies (Syrphidae) and pest controlling species (such as spiders and carabid beetles) can colonise and utilise wildflower compensation areas. In summer 2021 we performed sampling at 37 WCAs across Schleswig Holstein, northern Germany with yellow pan traps (for pollinators) and pitfall traps (for carabid beetles and spiders). This was combined with high resolution spatial data on the quantity of semi natural habitats and modelling of habitat fragmentation (using the mesh and connectance indexes, on-site botanical surveys to assess wildflower community composition and soil samples for carbon storage.

Our 2021 results indicated a significant positive relationship between bee species richness and both semi-natural habitat percentage and the mesh index at WCAs. We have not yet detected a significant relationship between semi-natural habitat or either habitat fragmentation metric for the richness or abundance of Syrphids (33 species detected across all WCAs).

We are repeating and expanding the study in summer 2022, and we are also implementing a recent eDNA method for detecting insects visiting wildflower heads (following a promising prototype last year and the initial work of Thomsen & Sigsgaard 2019) which we hope will inspire future research using this method, and allow us to detect which wildflower species are most effective.

All results are being used to create spatial models in InVEST (pollination and carbon) and Rangeshifter inform the future optimisation of WCA's (to improve the arrangement, size and duration of WCAs).

Keywords: eDNA, pollinators, wildflower compensation areas, spatial modelling, ecosystem services in agroecosystems

11. Type of submission: Abstract

O. Other sessions: O3 - Novel contributions to ecosystem service research - from early-career researcher perspectives

Bringing together ecology and paleontology to assess multi-temporal Ecosystem Services: a new opportunity for young researchers?

Presenting author: Alice Stocco

Other author(s): Elena Ghezzo

Contact: alice.stocco@unive.it

The evaluation of ecosystem services (ESs) usually refers to the capability of the ecosystems to offer benefits for humankind, and to the benefits that flow to the people, in terms of biophysical units or intangible values. The latter have a great importance when assessing the attractiveness of a study area for cultural ESs, such as tourism and educational activities, usually resulting in attractiveness maps which depend on the features of the current landscape. Nevertheless, in some places, the presence of geomorphological peculiarities, fossils, and paleontological or paleoanthropological records enhances the attractiveness of the area, allowing the visitors to couple outdoor activities with cultural benefits. In such cases, the capacity for recreational ESs that is due to the presence of the contemporary ecosystem benefits from an "additional layer" of attractiveness, which depends on the ecosystems of the deep past. Moreover, the additional layer has a higher value the more interesting the records are, considering the mind-blowing uniqueness of the unlikely conditions through which the traces of the past ecosystem came to us, and the fascination exerted by different kinds of animals on human curiosity. In this talk, we propose a new "multi-temporal approach" to assess the attractiveness for cultural ESs. We present the first application in Northern Italy, achieved thanks to the collaboration between ecologists and paleontologists. The resulting GIS-based map might represent a tool that drives decision-makers when focusing on priorities for preservation, development, or promotion of a locality. Indeed, the improved map highlights where and why the contemporary presence of more than one factor of attractiveness occurs, adding criteria for thematic pathways and guided tours that offer both the restorativeness of a natural landscape and the knowledge of the history of the Earth. We discuss how, from an early researcher perspective, this novel multidisciplinary approach offers networking opportunities between ecologists and paleontologists, as well providing improvement in local ESs assessment and natural capital quantification.

Keywords: Ecosystem services, GIS, paleontology, multi-temporal approach, early-researchers

12. Type of submission: Abstract

O. Other sessions: O3 - Novel contributions to ecosystem service research - from early-career researcher perspectives

Quality of life in social-ecological system units: Evidence from a global south case study

Presenting author: Patricia Santillán-Carvantes
Other author(s): Berta Martín-López
Affiliation: Leuphana University, Mexico
Contact: patricia.carvantes@stud.leuphana.de

The relationship between social-ecological systems and quality of life has mostly been studied using ecosystem services as a linkage. However, concretizing what human´s quality of life exactly is and how it can be measured remains under represented in the Ecosystem Services-Nature Contributions to People (NCP) literature. In this work, we measured self-reported quality of life through applying an inductive free-listing approach to the exploration of the relationships between social-ecological systems units (SESU) and human quality of life in the surrounding areas of the Chamela-Cuixmala Biosphere Reserve, Mexico. Applying content analysis and diverse statistical methods, we explored: 1) how is the quality of life perceived; 2) how does the subjective self-perceived quality of life change according to different SESU whose NCP are identified, and; 3) how do those subjective self-perceptions of quality of life relate to objective quality of life indicators.

We identified 30 different quality of life items highlighting financial security, freedom, and commonality. The SESU differed in their level of satisfaction related to the material and non-material quality of life items. Peasants from SESU with higher management intensity derived from a rooted livestock culture reported more unsatisfied self-perceptions of material and non-material items, even though they had better life conditions according to the objective indicators. Our results further point to the context-specific character of linkages between social-ecological systems units and human quality of life; stressing for one side, the role of core values and aspirations as the main drivers for landscape management and quality of life; and on the other hand, highlighting that unsatisfied quality of life is related to the fulfilment of basic needs. Those conditions are currently not secured in many Global South places. Future research would benefit from considering the experiential qualities of life as they relate to direct values and wider physical and psychological needs.

Keywords: Quality of life, peasants, tropical dry forest, livestock, culture

13. Type of submission: Abstract

O. Other sessions: O3 - Novel contributions to ecosystem service research - from early-career researcher perspectives

MAKE NATURE COUNT: ECOSYSTEM SERVICES IN THE ASN BIODIVERSITY FUND

Presenting author: Vince van 't Hoff
Other author(s): Mieke Siebers
Contact: vince.vanthoff@fsd.nl

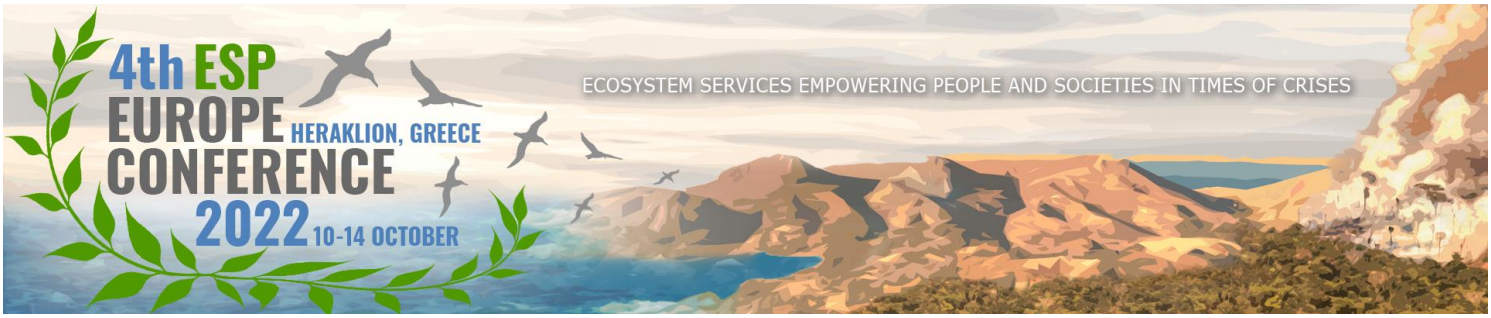
After several case studies with financial institutions, the Ecosystem Service Valuation Database (ESVD) development team has gained insights in aligning the monetary valuation of ecosystem services with impact assessments and risk analysis of financial institutions. Through their investments, financial institutions can be heavily dependent on ecosystem services and therefore, deterioration of nature causes risks for financial institutions: physical risks, transitional risks and reputational risks.

In several case studies, we assessed (possible) investments in land cover changes and how these land cover changes impact the flow of ecosystem services by means of monetary valuation using the ESVD. These case studies shed a new light on the importance of providing a place for nature on the equation of financial assessments, on the link between risk categories and ecosystem services and on the monetary impacts of financial investments on ecosystems.

One of the most important take-aways of these case studies is the understanding that different land covers and the corresponding difference in monetary value of ecosystem services (market vs non-market) are not distributed evenly. The ecosystem services benefits and losses therefore pinpoint to the direction of which stakeholders (private/public) are impacted. Subsequently, this delivers insights in the risks and opportunities for financial institutions which provides a direction of (needed) change towards sustainable management of ecosystems.

The case studies underline urgency and they support the development for financial institutions, businesses and policy makers to create new financial products, different PES mechanisms, as well as creating a larger and much broader stakeholder engagement.

Keywords: Financial institutions, Impact assessment, Monetary valuation, risks



14. Type of submission: Abstract

O. Other sessions: O3 - Novel contributions to ecosystem service research - from early-career researcher perspectives

Beyond carbon: the contribution of South America tropical humid and sub-humid forests to ecosystem services

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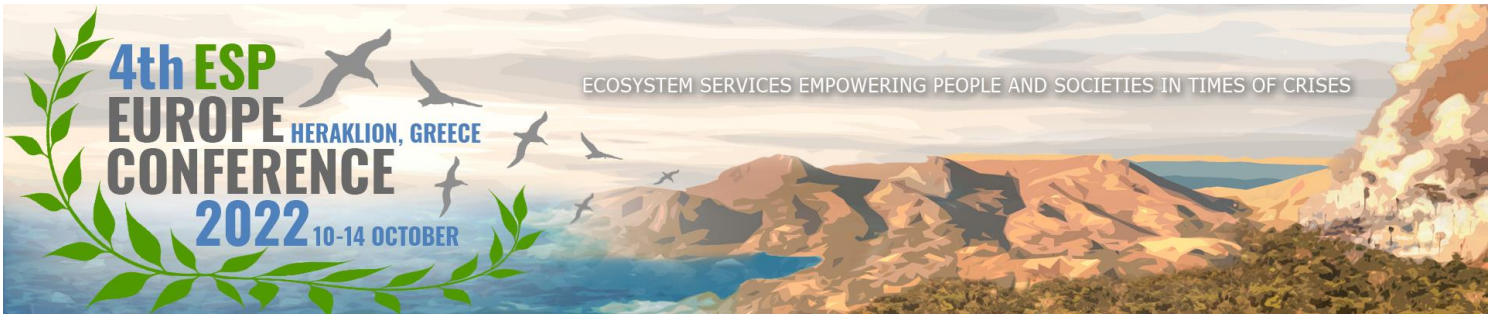
Tropical forests are well known for their role in storing carbon, but the total benefits people obtain from ecosystems (Ecosystem Services -ES) is highly unperceived. This review shows how South American humid and sub-humid tropical forests (biomes: Amazon, Atlantic Forest - AF, and Tropical Savanna - TS) provide ES beyond carbon-related ones. Our novelty relies on (i) reviewing the under-addressed non-carbon-related ES and (ii) describing the entire chain of processes from forest structure, composition, and function as enabling factors for supporting, regulation, provisioning, and cultural ES, to how they benefit society. While the climate and freshwater regulation services are linked to the forest structure and composition, provisioning services, such as pollination and forest products, are closely related to biodiversity, differentiating the main ES provided by these biomes. Even though we did not find ES related to rainfall production in the TS and AF, we found evidence that TS acts as a "water tank", storing rainwater in its deep and porous soils, gradually releasing it in the dry period. Mountain vegetation in AF, in its turn, can act as cloud forests to produce rainfall. We found no apparent differences between food provisioning, medicinals, and cultural ES provided by the forests, likely because these ES are more related to the biodiversity per se, and humans adapt their connectedness to the ecosystems accordingly to produce necessary goods. Due to its extensive dimension, a hypothetical loss of Amazon would strongly affect the global climate. However, the tipping point where Amazon starts an irreversible savanization is still to be defined. Local communities and small stakeholders have a high share of their well-being from forest ES, aggravating the socioeconomic consequences of its disruption. Tropical forests provide essential ES, and the awareness of the non-carbon related ones is critical for human well-being.



Keywords: Ecosystem Services, Nature's Contribution to People, Tropical Forest, South America, Climate Regulation.