



BOOK OF ABSTRACTS

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I. SESSION DESCRIPTION

ID: T8

Landscape aesthetic and cultural Ecosystem Services (CES)

Hosts:

	Title	Name	Organisation	E-mail
Host:	Dr	Alexandra Tisma		alexandra.tisma@pbl.nl
Co-host(s):	Dr	Rob Alkemade		rob.alkemade@pbl.nl

Abstract:

Landscape aesthetic quality (LAQ) is an important ecosystem service that positively affects humans' health and well-being. Different ecosystem services frameworks recognize the value of landscape aesthetics. For instance the Millennium Ecosystem Assessment (MEA, 2005b) defines LAQ as the pleasure people obtain from the aesthetic appreciation of natural and cultivated landscapes. The Common International Classification of Ecosystem Services framework (CICES, 2018) defines aesthetic quality as "characteristics of living systems that enable aesthetic experiences".

Overall, CES, often described as "intangible", are the least commonly quantified and mapped ecosystem services. This "intangibility" comes from the several reasons such as difficulty to assess human perceptions, cultural norms and plurality of values in a spatially explicit way (Egoh et al., 2012; Martínez-Harms and Balvanera, 2012; Crossman et al., 2013), preferences that vary widely across social and cultural contexts (Dramstad, Tveit, Fjellstad, & Fry, 2006; Zube & Pitt, 1981), subjectivity of human judgements, and scale dependency.

While landscape aesthetic values are commonly acknowledged as important CES (Hernández-Morcillo et al., 2013; Milcu et al., 2013; La Rosa et al., 2015), standardized approaches for the assessment and monitoring of landscape aesthetics are still missing, one reason for this is the methodological difficulty in quantifying it (Uessel, 2006; Kroll et al., 2012; von Haaren and Albert, 2011; Daniel et al., 2012).



In this session we would like to discuss the need to include LAQ in CES studies and lack of reliable methods to assess it, especially on large spatial scales. The following questions will be addressed:

- How to capture human perception in CES models?
- How do we deal with the subjectivity related to aesthetic experience?
- Should we skip LAQ from modelling environments and mapping on large (global) scale or accept the shortcomings and look for the future solutions and improvements?
- Is there a universal aesthetic quality? Or do we need to adjust for cultural differences? (and how?)

Goals and objectives of the session:

The goal of this session is to get insights and discuss about the proposed subject with the colleagues of different cultural and geographic backgrounds.

Planned output / Deliverables:

A short report about the findings of the session to be shared with the broader scientific community.

Session format:

Discussion forum

Voluntary contributions accepted:

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

Related to ESP Working Group/National Network:

Thematic Working Groups: TWG 8 – Cultural services & Values

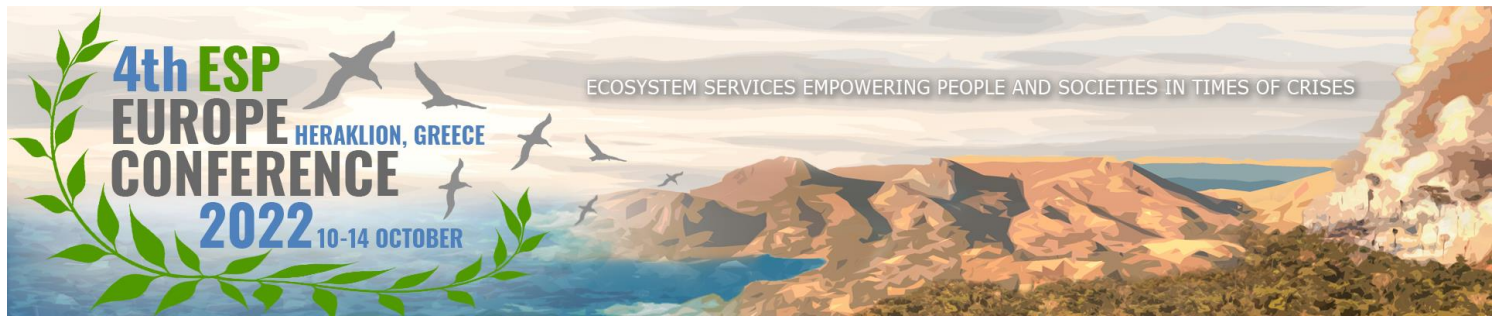
II. SESSION PROGRAM

Date of session: Wednesday, 12 October

Time of session: 11.00 – 13.00

Timetable speakers

Time	First name	Surname	Organization	Title of presentation
11.00 – 11.15	Alexandra	Tisma	PBL Netherlands Environmental Assessment Agency	Modelling landscape aesthetic quality on global scale using GLOBIO-ES-LAQ model



Time	First name	Surname	Organization	Title of presentation
11.15 - 11.30	Daria	Sikorska	Warsaw University of Life Science	How to make "wilderness" in cities attractive? A socio-ecological study on the attractiveness of informal green spaces in Warsaw
11.30 - 11.45	Marius	Kalinauskas	Mykolas Romeris University	Mapping and Assessment of Recreational Cultural Ecosystem Service Supply and Demand: Cultural and Natural Dimension Approach
11.45 - 12.00	Erik	Gomez-Baggethun	Norwegian University of Life Sciences	Climate change impact on cultural ecosystem services from ice and snow: The case of winter outdoor recreation in Oslo, Norway
12.00 - 12.15	Sylwia	Kulczyk	University of Warsaw	LIDAR, spectral, and self-employed data fusion for aesthetics experience assessment: a case of an urban park
12.15 - 12.30	Edyta	Laszkiewicz	University of Lodz	Would you walk through here? Determinants of seeking and avoiding urban wildscapes during utility and recreational walks
12.30-13:00			Discussion	

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

T. Thematic Working Group sessions: T8 – Landscape aesthetic and Cultural Ecosystem Services (CES)

How to make "wilderness" in cities attractive? A socio-ecological study on the attractiveness of informal green spaces in Warsaw



Presenting author: Daria Sikorska

Other author(s): Piotr Sikorski, Piotr Archiciński

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Reducing or abandoning vegetation maintenance in cities has become a strategy for increasing biodiversity, promoting contact with nature and reducing management costs. Lack of mowing leads to the development of spontaneous vegetation due to natural succession, which in turn might be unattractive to the residents. Here, we investigate Informal Green Spaces (IGS) bereft of cultivation and their suitability to meet the needs of the residents. We performed an in-depth socio-ecological study in 24 IGS with spontaneously developed vegetation in Warsaw. We identified factors essential for the IGS to be perceived as attractive, both in the vicinity (5 m) and within a broader perspective (50 m), which we extracted for single plots placed every 10 m along paths. As an attractiveness measure, we used 16 881 photographs taken by hired interviewers in the Visitors Employed Photography method, who visited all sites in 3 seasons. The accessibility was the factor most affecting the IGS attractiveness. We found that the vegetation in varying succession stages (early, medium, late) was differently perceived – vegetation in early and medium were preferred over late succession stages in close vicinity, while patches of woodlands and water bodies were preferred further within the view. We found seasonal variability in the IGS attractiveness, due to abundant blooming in ruderal vegetation in spring (early succession stage). Invasive species did not reduce the attractiveness and in spring positively affected the perception. Our study promotes IGS as a component of green infrastructure which facilitates green space availability and contact with nature.

Keywords: Natural succession, urban ecosystem services, preference survey, spontaneous vegetation, visual attractiveness

2. Type of submission: Abstract

T. Thematic Working Group sessions: T8 – Landscape aesthetic and Cultural Ecosystem Services (CES)

Climate change impact on cultural ecosystem services from ice and snow: The case of winter outdoor recreation in Oslo, Norway



Presenting author: Erik Gomez-Baggethun

Other author(s): David N. Barton, Tuomo Mikael Saloranta

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The concept of ecosystem services has been extensively used in relation to water and terrestrial ecosystems, but less attention has been paid to ecosystem services provided by ice and snow. Ice and snow provide habitat for many animal and plant species, regulate global temperature, are a key source of fresh water supply, and sustain multiple cultural services and values, including landscape aesthetics, support to the identity and culture of people living in high latitude and high-altitude areas, and recreational activities and winter sports. Ecosystem services from ice and snow are however being lost at alarming rates due to climate change. The aim of this paper is to examine climate change impacts on cultural ecosystem services from ice and snow with a focus on recreation. Using the peri-urban forests of Oslo as a case study, we assess how loss of ice and snow is affecting outdoor recreation as an important element of Scandinavian winter culture. First, we assess changes in snow cover over the last 60 years. Next, we model future changes in snow cover following different climate change scenarios. Finally, we assess the socioeconomic and cultural impact of shrinking ice and snow through loss of recreational ecosystem services and their associated values. Our results show that gradual linear changes in temperature at the study areas can lead to abrupt, non-linear change in the delivery of cultural ecosystem services.

Keywords: cultural services, cultural values, recreation, ice and snow, climate change

3. Type of submission: Abstract

T. Thematic Working Group sessions: T8 – Landscape aesthetic and Cultural Ecosystem Services (CES)

Mapping and Assessment of Recreational Cultural Ecosystem Service Supply and Demand: Cultural and Natural Dimension Approach

Presenting author: Marius Kalinauskas

Other author(s): Eduardo Gomes, Katažyna Bogdzevič

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Urban areas are expanding worldwide thus creating pressure for ecosystems and life quality challenges for urban dwellers. Recreational cultural ecosystem services (CES) are key in balancing human wellbeing in urban areas and healthy ecosystems. This study aims to map and assess the recreational CES supply and demand in Vilnius (Lithuania). A novel framework was used to assess natural and cultural dimensions of CES supply. This approach is not examined in previous CES studies. Natural dimension represents urban green areas, cultural dimension covers recreational infrastructures supported by natural environments. More specifically, we assessed natural recreational CES supply, cultural recreational CES supply, natural & cultural recreational CES supply, and cultural recreational CES demand. The supply model was validated using quantitative survey, representative for population of Vilnius. The results showed that the natural recreational CES supply dimension was highest in protected areas, while the cultural recreational CES supply dimension had highest values in the city centre. Historical old town and protected areas have highest values for natural & cultural recreational CES supply. The demand for recreational CES was highest in the areas near the city centre. There was a mismatch between the natural recreational CES supply dimension and recreational demand. A match was found between cultural recreational CES supply, natural & cultural recreational CES supply, and recreational CES demand. The models had a clustered pattern (Getis Ord-GI*). The natural recreational CES supply dimension had a hot spot in the northern part of the city. Cultural recreational CES supply dimension, natural & cultural recreational CES supply, and recreational CES demand were clustered in the city centre. The results are important for scientists and planners, focused on balancing natural areas and recreational objects in urban setting. The results are relevant in supporting regional and global environmental targets (e.g., EU Biodiversity 2030; UN Sustainable Development Goals).

Keywords: Cultural Ecosystem Services, Recreation, Lithuania

4. Type of submission: Abstract

[T. Thematic Working Group sessions: T8 – Landscape aesthetic and Cultural Ecosystem Services \(CES\)](#)

LIDAR, spectral, and self-employed data fusion for aesthetics experience assessment: a case of an urban park



Presenting author: Sylwia Kulczyk

Other author(s): Sylwia Kulczyk, Marta Derek

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Although aesthetic experiences are widely recognized as an important CES, at the same time they are difficult to quantify due to their intangible and relational character. As aesthetic experiences are the effect of complex relationships between people and the landscape, both ecological and social approaches should be combined for a more detailed understanding of how aesthetic experiences are formed and delivered.

The study aims to identify and map the aesthetic CES of the public park in Warsaw, Poland. To describe the vegetation (ecological aspect of the aesthetic experience), LiDAR and spectral data were used. On this basis, the elements of green spaces (trees, bushes, herbaceous vegetation, etc.) and their characteristics (for example, tree height, bushes density, vegetation permeability, temporal variability) were mapped and quantified. The inventory obtained helped develop X-D landscape indices that describe green spaces' landscape diversity. To explore how people perceive specific green spaces (social aspect of the aesthetic experience), self-employed mapping was carried out with users of green areas. Participants were asked to take pictures of the most attractive settings in the park and then to select 10 of the most beautiful places. Finally, both data sets were compared to verify the relationship between landscape indicators and the visual social evaluation of the urban natural environment.

The conducted study unveils that LiDAR and spectral data are a rich source of information that helps to identify and map aesthetic CES delivered by urban green spaces.

Keywords: Aesthetics, urban green, data fusion, 3-d landscape structure index

5. Type of submission: Abstract

[T. Thematic Working Group sessions: T8 – Landscape aesthetic and Cultural Ecosystem Services \(CES\)](#)

WOULD YOU WALK THROUGH HERE? DETERMINANTS OF SEEKING AND AVOIDING URBAN WILDSCAPES DURING UTILITY AND RECREATIONAL WALKS



Presenting author: Edyta Laszkiewicz

Other author(s): Piotr Sikorski, Piotr Archiciński

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Walking is a primary physical activity that could ensure the contact of urban inhabitants with nature provided they walk through green spaces. While the green surrounding of walks is predominantly linked to generic green spaces such as urban parks or street greenery, there are more potential green sceneries. One of the alternatives can be walking through urban wildscapes in a form of greenery mainly shaped by nature and making the visual impression of being “natural” or even “wild”. It can be debated whether city inhabitants are willing to walk through urban wildscapes and what could attract them to make such a walk. This study evaluates factors supporting and limiting the willingness to walk through urban wildscapes. The study was conducted using a computer–assisted web survey among N=524 green space users from Warsaw (Poland). Participants were asked to assess photomontages in order to collect data on self–reported willingness to traverse various urban wildscapes. Eighteen different urban wildscapes were evaluated as a potential green scenery for both utility and recreational walks. Random effect models hinted towards the willingness to walk through urban wildscapes being higher for recreational walks than utility walks. Scattered greenery and grasslands were preferred for utility walks. Dense greenery and forests were preferred for recreational walks. City inhabitants may benefit from the broader acceptance of walking through urban wildscapes without the costly manicurisation of “wild” green spaces. The findings are in line with the discussion on social–ecological connectivity and demonstrate that the “nature of the fourth kind” can be taken into account when planning green corridors to meet societal and environmental needs.

Keywords: walking behaviours; willingness to walk; preferences; social–ecological connectivity, “fourth” nature

6. Type of submission: Abstract

[T. Thematic Working Group sessions: T8 – Landscape aesthetic and Cultural Ecosystem Services \(CES\)](#)

Re–thinking of agri–environmental measures for mountain terraced landscapes: evidence from Cyprus



Presenting author: Christos Zoumides

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Agricultural dry-stone terraces are a distinctive landscape characteristic in many Mediterranean mountain regions. Terraces provide a wide array of ecosystem services, including provisional (e.g., greater farming potential on steep slopes that would otherwise be very difficult to cultivate); regulating (e.g., retention of water, soil and reduction of natural risks such as floods (Camera et al., 2018); supporting (e.g., biodiversity conservation of various plant and animal communities, improved nutrient cycle, soil organic carbon (Djuma et al., 2020)); and cultural (e.g., traditional technique with important ethnological, historic and touristic value). Over the past 50 years traditional terraces are gradually abandoned due to the depopulation of mountain communities, leading to the collapsing of dry-stone walls and soil erosion. The knowledge of properly constructing dry-stone walls is also forgotten, while previous EU Common Agricultural Policies encouraged new terracing methods with heavy earth-moving machinery. In the Troodos Mountains of Cyprus, a community-based approach to rehabilitate collapsing dry-stone walls and preserve the local knowledge through practical, hands-on workshops was initiated in 2015 (Zoumides et al., 2017). This effort continues through the 3PRO-TROODOS project, and a manual for proper construction and maintenance of traditional dry-stone walls is under preparation. Recent evidence (Zoumides et al., 2022) indicates that terraces are a costly investment while existing subsidies cover a small part of maintenance costs. These measures often fail to address the future of terraced landscapes. We argue that policies need to consider the local knowledge and the outcomes of multi-disciplinary approaches to generate solutions to the complex social and environmental issues related to terraced landscapes. New and targeted agri-environmental measures for mountain terraces should consider their actual cost, as determined by site-specific characteristics (e.g., elevation, slope, and geology), as well as their multifunctional ecosystem services. Such measures could give funding access to other entities besides farmers (e.g., NGOs, associations and social cooperatives) for protecting and enhancing terraces for generations to come.

Keywords: mountain agriculture, rural development, agri-environmental measures, cultural landscapes, terraces



7. Type of submission: Abstract

T. Thematic Working Group sessions: T8 – Landscape aesthetic and Cultural Ecosystem Services (CES)

Modelling landscape aesthetic quality on global scale using GLOBIO-ES-LAQ model

Presenting author: Alexandra Tisma

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Landscape aesthetic quality (LAQ) is an important ecosystem service that positively affects humans' health and well-being. Different ecosystem service frameworks recognize the value of landscape aesthetics. The Millennium Ecosystem Assessment (MEA, 2005b) defines LAQ as the pleasure people obtain from the aesthetic appreciation of natural and cultivated landscapes. The Common International Classification of Ecosystem Services framework (CICES, 2018) defines aesthetic quality as "characteristics of living systems that enable aesthetic experiences".

LAQ provides the backdrop and physical precondition for many nature-related recreation and tourism activities. Standardized approaches for assessing and monitoring landscape aesthetics are missing, and therefore LAQ is often omitted in ecosystem service studies and in global environmental assessments. Lower LAQ can lead to a decrease in ecosystem services for tourism and recreation. Hence assessing LAQ can provide better insights into the economic and social consequences of its change and help guide environmental policies and/or spatial plans.

This paper presents the first results of the model GLOBIO ES-LAQ for assessing landscape aesthetic quality (LAQ) in the context of the GLOBIO-ES (<https://www.globio.info>) model suite. The GLOBIO ES-LAQ model is built on a set of relationships between landscape characteristics and land use properties. We derive LAQ from landscape indicators and metrics deduced from the literature, referring to a core set of people's basic common landscape preferences. Three indicators are selected based on the availability of data on the global level: scenic beauty, visual diversity, and tranquility. Mapping and calculations are made with the raster of 300m. The results of the model show that most of the terrestrial part



of the earth (72%) has moderate scenic beauty, very high (89%) tranquility and about 42% medium or high visual diversity. A combination of these three indicators shows that 53% of the globe has medium and 44% medium to high LAQ. These results can be explained by the fact that on a global level urban areas, infrastructure, and intensive agriculture, which are classified as having negative impact on LAQ, are much less present than natural areas, which count as positive. The results of the modelling on the global scale are indicative and meant only to be used on that scale; for any smaller areas, additional analyses need to be done.

Keywords: landscape aesthetic, ces, globio