BOOK OF ABSTRACTS

I. SESSION DESCRIPTION

ID: T9

Shaping Healthier Cities. Ecosystem Services and Health for a responsive human-nature relations

Hosts:

	Title	Name	Organisation	E-mail
Host:		Stefano Salata,	Department of City and Regional Planning, Faculty of Architecture, Izmir Institute of Technology	ssalata1983@gmail.com
Co-host(s):		Diogo Guedes Vidal	University Fernando Pessoa, PT	diogovidal@ufp.edu.pt,
		Martina Artmann	Leibniz Institute of Ecological Urban and Regional Development (IOER), DE	m.artmann@ioer.de
		Fátima Alves	Universidade Aberta & Centre for Functional Ecology, University of Coimbra, PT	fatimaa@uab.pt
		Ana Isabel Ribeiro	Public Health Institute University of Porto, PT	ana.isabel.ribeiro@ispup.up.pt

Abstract:

Cities have become the predominant living environments of human beings worldwide. In an era of social-ecological crisis intensified by climate change, loss of biodiversity and socio-environmental injustice, the shaping of responsive cities is crucial for fostering healthy and regenerative urban societies and nature preservation. The role of urban environmental spatial qualities should be re-thought in light of the pandemic diffusion. However, neither the relationship between the daily environmental conditions of urban citizens and their health nor the interconnection between healthy nature as a basis for resilient cities are organically included in urban design, thus limiting the capacity for shaping healthier cities. The questions that shape this Session are: What is the relation between health and ecosystem services in urban areas? How nature's health at multiple scales (e.g., urban to planetary ecosystems) is interconnected with healthy urban societies, and how can nature protection be linked with health protection?

Goals and objectives of the session:

Despite ecosystem services relations with urban planning has been at the centre of numerous publications aiming at finding practical solutions for building sustainable cities, the systematic investigation of how ecosystem services affect human health is still an open subject. Furthermore, the well-being of citizens is a concept that goes beyond the

instrumental values of nature, which are the focus of the ecosystem service concept. In this regard, an integrative ecosystem services valuation needs to consider relational and intrinsic values unfolding in responsive human-nature relations striving for a good life for human and non-human nature in cities and beyond. Healthy urban human-nature relations call for a fundamental shift in attitudes and norms regarding how we deal with nature, considering that our health is inseparable from nature's health. And this is also linked with biocultural diversity, which has gained attention since recognising the intangible culture as a key for promoting intercultural dialogue among communities. Biocultural diversity arises from the links and feedbacks between cultural diversity and biological diversity and is a dynamic concept that includes the cultural dimension of nature. The main goal of this Session is to collect advancements aiming to holistically conceptualize and analyze the relations mentioned above using novel approaches that reflect environmental, ethical and inner implications of human-nature healthy cities.

Planned output / Deliverables:

This Session wants to collect manuscripts investigating the relationship between well-being, nature, land uses, and ecosystem services using an organic and integrated perspective. Also, conceptual papers and case studies reflecting on norms and ethics concerning the responsive relationship between the health of human and nonhuman nature are warmly welcome.
Inter-and transdisciplinary approaches among urban scientists, functional ecologists, sociologists, ecosystem modelers, geographers, environmental philosophers and environmental medicine analysts are welcomed, especially as they deal with experiences of quantitative/ qualitative approaches that overcome the data analysıs through GİS assessment and includes societal, citizens and urban users' perspectives. Papers that consider pluralistic valuations of ecosystem services for healthy human-nature relations nourished by non-anthropocentric worldviews are particularly welcome. Collected abstracts should be evaluated in the light of their capacity to furnish advancements for shaping healthy relationships with nature in cities and worldwide, such as through urban planning.

Session format:

Standard session (presentations)

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 9 – ES & Public health

II. SESSION PROGRAM

Date of session: Thursday 13 October 2022
Time of session: 11.00 – 12.30

Timetable speakers

Time	First name	Surname	Organization	Title of presentation
11.00	Diogo Guedes Fátima	Vidal Alves	CFE | University of Coimbra	Introduction: Environment, Nature, and Climate Change Issues
11.20 – 11.30	Luís	Valença Pinto	ESAC | MRU	Contribution of the urban green areas to ecosystem services supply and wellbeing Do Park characteristics affect the spatial distribution of recreational activities in an urban park? A case study in Vilnius, Lithuania
11.30 – 11.40	Sylwia	Kulczyk	University of Warsaw	The quest for a perfect park. CES as providers of human well-being in urban green spaces
11.40 – 11.50	Nora	Fagerholm	University of Turku	Pandemic urban resilience in the Nordic context: a cross-city analysis on associations between outdoor recreation and green infrastructure
11.50 – 12.00	Adrian	Hoppa	Warsaw University Of Life Sciences	The role of vegetation in mitigating local air pollution concentrations on children's routes to school.
12.00 – 12.10	Brenda Maria	Zoderer	University of Natural Resources and Life Sciences, Vienna	The Biocultural Diversity of Urban Wilderness
12.10 – 12.20	Maria	Gomez-Ssaldarriaga	East Carolina University	Human health indicators in relation to mangrove habitats in Jamaica: a spatial econometric approach.
After 12.20				Wrap-up/Conclusions

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: T9 - Shaping Healthier Cities. Ecosystem Services and Health for a responsive human-nature relations

Do Park characteristics affect the spatial distribution of recreational activities in an urban park? A case study in Vilnius, Lithuania

Presenting author: Luís Valença Pinto
Other author(s): Carla Sofia Santos Ferreira, António Dinis Ferreira
Affiliation: ESAC | MRU, Portugal
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Urban parks are key elements for human well-being in cities, as recognized by the United Nations through its Sustainable Development Goals. They provide a diverse set of ecosystem services, from which we can highlight cultural ecosystem services as the most directly enjoyed services by urban dwellers, significantly contributing to human well-being. Urban parks' value is especially relevant considering the everyday challenges faced by cities all over the world, with a projected increase in the intensity of use by a growing urban population amid increased pressure for physical space for urban growth and a predictable increase in the heat-island effect, and subsequent pressure in vegetation and water usage, derived from climate change. Urban parks can offer a wide diversity of differentiated spaces in terms of, e.g., vegetation type and coverage, solar exposure, terrain morphology, landscapes, and available equipment (e.g., sport, cultural). On the other hand, park users have different preferences for activities and space interaction. Few studies were found addressing the links between park characteristics and spatial distribution of activities in the parks and which characteristics contribute to and influence these differences. We applied a LISA spatial autocorrelation analysis (Moran's I Index) to a dataset of 2,969 georeferenced observations of stationary users engaging in diverse activities in the Bernardino Garden in Vilnius, Lithuania, crossing this information with land use information and associated park characteristics. The results showed significant spatial correlations regarding different groups of activities. The activities related to Activities with kids are mainly associated with playground areas and surrounding lawn areas. Social activities are associated with large spaces in the central, west-to-east areas. Sport and water activities are mainly associated with two small areas with direct access to the Vilnia River. Activities with dogs show significant associations with smaller areas in the center and northeastern areas of the park. Results are relevant for park design and management, especially considering the challenges urban design faces due to climate change and urban growth.

Keywords: Urban parks, cultural ecosystem services, recreational activities, spatial autocorrelation

2. Type of submission: Abstract

T. Thematic Working Group sessions: T9 – Shaping Healthier Cities. Ecosystem Services and Health for a responsive human-nature relations

Citizen Participation and Climate Change: Social Perceptions about Climate Change – a case study in the Central Region of Portugal

Presenting author: Diogo Guedes Vidal

Other author(s): Diogo Guedes Vidal, Cátia Leal

Affiliation: Departamento de Ciências Sociais e de Gestão, Universidade Aberta, Portugal/Centre for Functional Ecology – Science for People & the Planet (CFE), TERRA Associate Laboratory, Department of Life Sciences, University of Coimbra, Portugal, Portugal

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Research on social perceptions and effective participation about Climate Change (CC) appears to be a critical component of the socio-political contexts in which CC mitigation and adaptation plans and the necessary political and behavioral change for the ecological transition are developed. This study sought to develop itself as a strategy to involve populations in the elaboration of Climate Change Local Adaptation Plans, through a questionnaire survey applied online. The aims were to characterize their perceptions regarding CC, as well as incorporate their contributions, both in the diagnosis of the situation and in the identification of adaptation measures to be defined at the municipal level to deal with CC. The 326 individuals from 19 municipalities that responded were mainly females (62%), 25-54 years (73%) with a university degree (86%). 85% identified CC as a serious problem and 89% revealed that its impacts were already being felt. However, this perception was less evident at the local (48.5%) and regional levels (74.2%), where 9.5% believed that CC was not a problem. Regarding the causes of CC, 66% believed they were anthropogenic and that citizens have in their hands a shared responsibility to tackle them (56%), by changing their behaviors (98%). 76% had already participated in a plan/initiative associated with the CC, but only 21.4% were able to identify which one. The identification of local priorities for the adaptation plan revealed that forest management, the promotion of renewable energy, the protection of ecosystems, and the development of measures to deal with natural risk were at the top of the priorities. This study provides important guidelines for understanding how local populations conceive, explain and deal with CC in their territorial contexts, reinforcing the need for effective participation in identifying intervention priorities and measures to deal with their impacts.

Keywords: Climate Change Perceptions, Citizen Participation, Socioeconomic vulnerabilities, Healthier cities and territories

3. Type of submission: Abstract

T. Thematic Working Group sessions: T9 - Shaping Healthier Cities. Ecosystem Services and Health for a responsive human-nature relations

Facing the human health impacts of a changing climate: evidence from the southern European region

Presenting author: Diogo Guedes Vidal

Other author(s): Diogo Guedes Vidal, Karine Wlasenko Nicolau

Affiliation: Departamento de Ciências Sociais e de Gestão, Universidade Aberta, Portugal/Centre for Functional Ecology - Science for People & the Planet (CFE), TERRA Associate Laboratory, Department of Life Sciences, University of Coimbra, Portugal, Portugal

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Extreme weather events caused by climate change, especially extreme heat and cold waves, are expected to increase in the next years. Due to its geographical characteristics, Portugal is among the European countries with the greatest vulnerability to these impacts, affecting disproportionality different socioeconomic groups, especially those with respiratory or circulatory health conditions, children, and the elderly. Set against this background, this study assessed the up-to-date knowledge of the current impact of weather and climate variability on the population health in the Central region of Portugal, namely the epidemiological evidence of the effects of heat waves and extreme cold on human health. The results are enlightening: mortality rates and hospital admissions associated with exposure to extreme temperature indicate growing evidence that climate-health relationships pose increasing health risks. Throughout the region studied, a significantly raised risk of heat-related and cold-related mortality was observed, translated directly by deaths from cardiovascular and respiratory diseases, affecting more elderly people, which altogether with days of prolonged extreme cold increase hospitalization with influenza (flu) and respiratory problems. Climate change presents itself as an urgent public health issue requiring attention to prepare for the future and shape healthier cities, fostering changes that go beyond health services involving structural transformations in the urban environment and in the socioecological relationships between humanity and the planet.

Keywords: Climate-health impacts, Extreme weather events, Socioeconomic vulnerabilities, Healthier cities

4. Type of submission: Abstract

T. Thematic Working Group sessions: T9 – Shaping Healthier Cities. Ecosystem Services and Health for a responsive human-nature relations

The quest for a perfect park. CES as providers of human well-being in urban green spaces

Presenting author: Sylwia Kulczyk
Other author(s): Marta Derek, Edyta Woźniak
Affiliation: University of Warsaw, Poland
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Green spaces are widely recognised as important providers of CES for urban residents. They play an essential role in maintaining both physical and mental health of urban citizens, and largely contribute to their well-being. Urban green spaces (UGS) are, however, very diverse, and understanding how this diversity influences the flow of CES still requires insights of the knowledge on peoples' preferences, behaviours and perceptions.

The main aim of this paper is to explore how the relationship between cultural ecosystem services and human well-being is shaped within different types of UGS. In particular, we want to explore what kind of public UGS attract people more, and what people's characteristics influence their perception of UGS. The case study here is the Warsaw urban zone, Poland.

In order to fulfil this aim a survey has been conducted with 1000 residents of the city and its surroundings. The sample was representative in terms of gender, age, education, and a type of the environment people live in. Eight photographs presenting main types of public UGS in Warsaw urban zone were used in the questionnaire. These types were differentiated in relation to vegetation types, infrastructure opportunities, and riverfront type. The respondents were asked what type of UGS they would choose to undertake different activities which contribute to their well-being. They were also asked a number of questions which regarded their preferences for these areas.

The study revealed that different types of UGS provide different benefits to humans. Some UGS are associated with more mental well-being (e.g. forests, where 80% of the respondents declare they would go there to observe nature), while other with more physical well-being (e.g. well-maintained riverfront, with 47% of the respondents declaring they would go there to do sport). These tendencies are also shaped by the residents' characteristics.

Keywords: urban green, well-being, cultural ecosystem services, demand

5. Type of submission: Abstract

T. Thematic Working Group sessions: T9 – Shaping Healthier Cities. Ecosystem Services and Health for a responsive human-nature relations

The sociocultural constructions of Nature and Environment: preliminary outcomes of a systematic literature review

Presenting author: Diogo Guedes Vidal

Other author(s): Cristina Sá Valentim, Helena Freitas

Affiliation: Centre for Functional Ecology – Science for People & the Planet (CFE), TERRA Associate Laboratory, Department of Life Sciences, University of Coimbra, Portugal, Portugal

Contact: diogoguedesvidal@hotmail.com

The recognition of Nature and the Environment as sociocultural constructions is key to enhance a transformational socio-ecological change. That means understanding the production of their different socio-cultural meanings, how societies tackle them, and to what extent different understandings can condition the implementation of a deep socio-ecological change. To the authors' knowledge, no studies have systematized the evidence regarding this diversity of perceptions. Therefore, a systematic literature review was conducted according to the PRISMA guidelines, through the combination of “Nature”, “Environment”, “Representation”, “Definition”, “Understanding” and “Perception” keywords with no restrictions on publication date, scientific field, or document type and language. In the first approach, the Web of Science database was selected, and 27266 results were identified. By assessing the full-text articles for eligibility, 298 results meet the inclusion criteria. A preliminary analysis reveals that most of the studies were conducted in Anglo-Saxon countries, and mainly in the scientific fields of Geography, Psychology, and Sociology. Besides, Nature and Environment concepts are often used as synonymous, and a bibliometric analysis unveils that the keyword “Environment” is used before “Nature”. The concepts of ecofeminism, environmental justice, colonialism, and capitalism emerged in the studies reviewed, revealing that different representations and ways that society relates to Nature have been historically influenced by these social processes: from a wild Nature that should be controlled by humans to meet their needs and desires, to a Nature that integrates everything, such as human culture, where all species are influenced by its dynamics and cycles. This preliminary analysis may pave the way to, first, understand the diversity of social perceptions and representations towards Nature and Environment concepts in a systematic way and, second, identify the main drivers and resistances that the implementation of a socioecological transformation change may face in different sociocultural contexts.

Keywords: Society-Nature relations; Nature representations; Environment representations; Systematic literature review

6. Type of submission: Abstract

T. Thematic Working Group sessions: T9 - Shaping Healthier Cities. Ecosystem Services and Health for a responsive human-nature relations

Contribution of the urban green areas to ecosystem services supply and wellbeing

Presenting author: Luís Valença Pinto
Other author(s): Carla Sofia Santos, Paulo
Affiliation: MRU, Portugal
Contact: lmpinto@mac.com

Urban green spaces (UGS) supply relevant ecosystem services (ES), which are fundamental to human wellbeing. However, the provision of UGS, their characteristics, and the ES they supply vary greatly across the globe. Furthermore, different areas of research are concerned with different dimensions of wellbeing and different types of ES while using different methodologies for assessing wellbeing benefits derived from ES provided by UGS. Thus, knowledge tends to be dispersed, partial, and sectorial, making it difficult to have a global view of the subject. This global view is fundamental to identifying possible research gaps. A global and more profound understanding of the UGS contributions to the different ES domains and overall wellbeing dimensions is fundamental to supporting decision-making and urban planning to counter climate change's adverse effects and improve cities' livability. Current data is sectorial and scattered, and a comprehensive understanding of the impacts of distinct UGS types is required. The work focused on evaluating UGS's contribution to wellbeing through a systematic review, focused on getting a global picture of (1) the spatial distribution of UGS research; (2) the UGS types investigated; (3) the ES analyzed; (4) the wellbeing dimensions studied; (5) the ES and wellbeing dimensions associated with UGS; and (6) the methods used to study ES and wellbeing relations in cities. The results show a prevalence of studies in Europe, Asia, and North America. Results also show the lack of a common UGS concept, making it more challenging to do a comparative analysis between UGS types. Furthermore, the wellbeing concept is also research-field dependent. The results highlighted that parks and gardens are the most studied UGS types. ES coverage is primarily focused on CES, and most articles are focused on mental and physical health dimensions of human wellbeing. Results provide valuable insights that can help optimise research in evaluating wellbeing benefits from ES provided by UGS.

Keywords: Urban green spaces, ecosystem services, wellbeing dimensions, systematic review

7. Type of submission: Abstract

T. Thematic Working Group sessions: T9 - Shaping Healthier Cities. Ecosystem Services and Health for a responsive human-nature relations

Emerging patterns of human behavior in urban green spaces: the potential of behavioral mapping towards responsive human-nature relations

Presenting author: Diogo Guedes Vidal

Other author(s): Helena Vilaça, Nelson Barros

Affiliation: Center for Functional Ecology - Science for People & the Planet (CFE), TERRA Associate Laboratory, Department of Life Sciences, Faculty of Sciences and Technology, University of Coimbra, Portugal, Portugal

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Public Urban Green Spaces (PUGS) play a vital role in the dense urban fabric as places of people-nature contact but also as socialization spots. Despite some advances in the field, the relationship between the PUGS surroundings and their users' behaviors remains unclear. Therefore, this study examined the patterns of human behavior in four PUGS of the city of Porto, on the north Portuguese coast. The Behavioural Mapping (BM) method was applied in four PUGS between August and November 2020 and observational data regarding 979 users' socio-demographics and behaviors were recorded. BM was administered during the weekday morning/afternoon and weekend morning/afternoon, totaling twelve observation sessions per PUGS. PUGS locations were determined according to the Socioeconomic Deprivation Index. The use patterns during different times of the day were disaggregated across behaviors and users' profiles and their relationship with the surroundings and design elements was assessed with ANOVA, Chi-Square test and Pearson correlation. The users were mostly male adults or elderly, visiting the PUGs in a group (52.5 %). Children and adolescents visited the PUGS less (5.4 %). Main activities observed included talking, eating, and physical exercise, which occurred mainly on sunny days and during the morning. PUGS crowdedness varies significantly ($p < 0.001$) between the sites: PUGS located in low deprivation areas presented a higher crowd-level when compared with those located in high deprivation areas. Also, frequent space alone was more usual in the first. It was also identified variations over time, morning and afternoon, concerning users' behaviors. The use of the physical space of PUGS is influenced by its elements and natural diversity and stimulating level. These findings may pave the way for future research towards responsive human-nature relations to inform design through the effectiveness of the projects proposed, by providing more accurate aligning between the greenspace design language with users' needs.

Keywords: behavioral mapping, urban green spaces, society-nature relations, healthier cities

8. Type of submission: Abstract

T. Thematic Working Group sessions: T9 – Shaping Healthier Cities. Ecosystem Services and Health for a responsive human-nature relations

The role of vegetation in mitigating local air pollution concentrations on children's routes to school.

Presenting author: Adrian Hoppa

Other author(s): Daria Sikorska, Piotr Sikorski

Affiliation: Department of Remote Sensing and Environmental Assessment, Institute of Environmental Engineering, Warsaw University of Life Sciences-SGGW, Nowoursynowska 159 Str., 02-776 Warsaw, Poland, Netherlands

Contact: adrian_hoppa@sggw.edu.pl

Air pollution is now considered one of the world's most significant threats to human health and the surrounding natural environment. Present research illustrates that particulate air pollution causes more than 300,000 deaths per year in the European Union, and Poland is one of the countries with the highest air pollution in the region. Progressing urban development is expected to further contribute to an increasing particulate matter in the future. A population group that is particularly vulnerable to air pollution is children. Vegetation plays a vital role in purifying the air in urban areas. It protects people from particulate pollution and absorbs toxic substances in it. We conducted a study to determine the role of trees in cleaning the air of pollutants on children's routes to schools. Present studies indicate that the form of vegetation influences the level of ambient particulate matter concentrations. Tree canopies can absorb dust on their leaves and modify their flow, leading to local concentrations of pollutants. We investigated primary schools located in a large urban area in Poland – Lodz, a post-industrial city, were considered. We measured particulate matter concentrations and LAI on selected routes leading to schools to determine the relationship between tree density and particulate matter concentrations to study the effectiveness of tree canopies in purifying the air. The results confirmed the influence of trees on reducing the level of particulate matter, but the effect is variable and not entirely conclusive. We highlight the need to expand the study on avoiding local concentrations of pollutants and allow the survey to make preliminary recommendations for forming greenery alongside schools.

Keywords: air pollution, urban agglomeration, particulate matter, trees, children

9. Type of submission: Abstract

T. Thematic Working Group sessions: T9 – Shaping Healthier Cities. Ecosystem Services and Health for a responsive human-nature relations

The Biocultural Diversity of Urban Wilderness

Presenting author: Brenda Maria Zoderer
Other author(s): Christa Hainz-Renetzeder,
Affiliation: Institute of Landscape Development, Recreation and Conservation Planning, University of Natural Resources and Life Sciences, Vienna,
Contact: brenda.zoderer@boku.ac.at

Given the current sustainability challenges cities are facing, the promotion of nature-based solution has become increasingly important in urban planning and policy-making. Despite their many benefits, these efforts often represent technological solutions that use nature in its controlled form. In contrast, alternative urban greenspaces that provide nature more space to self-develop, so called urban wilderness, have received only little attention. In this presentation we will reflect on the potential of urban wilderness as a social-ecological inclusive approach to urban greening. To this end, we investigate the biocultural diversity of urban wilderness in Vienna and explore its social acceptance among citizens. Based on secondary data, field observations and a survey with residents of Vienna (N=800), different types of urban wilderness are identified, characterised and analysed with regard to their social and ecological significance. The study reveals a great variety of different manifestations of urban wilderness in Vienna, differing in terms of vegetation structure, species composition, governance and management regime as well as the type human-nature interaction they offer to urban residents. Three such manifestations are examined in depth: urban forests, urban wastelands and natural meadows. The results of the survey show that all three types of urban wilderness are of great socio-cultural importance and that the majority of respondents would accept them as alternatives to lawns in urban parks and as design elements of new urban neighbourhoods. Both perceived importance and social acceptance are particularly high for urban forests and natural meadows, but may vary among social groups. Social-ecological inclusive and equitable greenspace planning should take particular account of these group differences and the diversity of human-nature relationships that urban wilderness makes possible in cities.

Keywords: Urban rewilding, human-nature relationship, urban biocultural diversity, plural valuation, inclusive urban greenspace planning

10. Type of submission: Abstract

T. Thematic Working Group sessions: T9 - Shaping Healthier Cities. Ecosystem Services and Health for a responsive human-nature relations

Human health indicators in relation to mangrove habitats in Jamaica: a spatial econometric approach.

Presenting author: Maria Gomez-Ssaldarriaga
Affiliation: East Carolina University, United States of America
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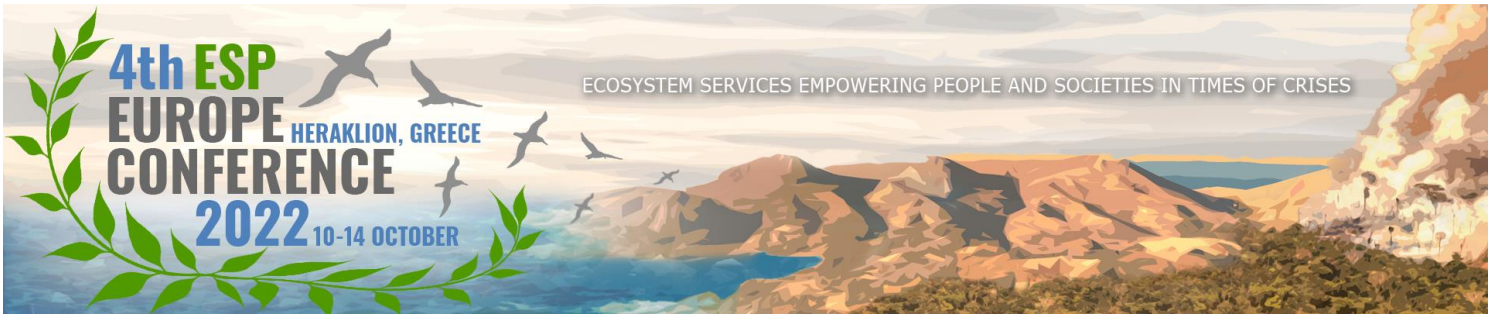
There is an increasing interest to use the Ecosystem Services Framework to directly link environmental change to human health outcomes (Bayles et al. 2016). For example, previous work has shown connections between forest degradation and malaria (Chaves et al. 2018) or childhood diarrhea (Rasolofoson et al. 2021). However, the human health connections to other types of ecosystems are not as well-studied. This study aims to address this gap by examining human health indicators in proximity to mangrove ecosystems. Mangroves are woody plants that grow at intertidal zones in tropical and sub-tropical latitudes and are among the world's most productive ecosystems (Kathiresan and Bingham 2001). Mangroves provide a wide range of ecosystem services such as delivering firewood, food, and construction materials, acting as a natural barrier to stabilize shorelines and reduce effects of storms and flooding, maintaining water quality, supporting wildlife and fisheries, and sequestering carbon from the atmosphere through photosynthesis (Mukherjee et al. 2014). Yet, the specific health benefits that mangroves provide to surrounding coastal communities is not well documented, especially given that for years, mangrove areas were thought to be vectors of disease (Friess et al. 2016). Using Jamaica as a case study due to its vast mangrove ecosystems, this study takes a combination of remote sensing techniques and spatial econometric approaches to examine human health indicators near mangrove ecosystems and its relationship with ecosystem health. Data from World Bank Living Standard Measurement Study (LSMS) are georeferenced in relation to mangrove habitats. Specifically, the following health indicators are assessed: dietary diversity, instances of recurring illness, number of visits to health professionals, and cost of medical services.

Keywords: ecosystem health, ecosystem services valuation, human health, spatial econometrics, and remote sensing.



11. Type of submission: Abstract

T. Thematic Working Group sessions: T9 - Shaping Healthier Cities. Ecosystem Services and Health for a responsive human-nature relations

Pandemic urban resilience in the Nordic context: a cross-city analysis on associations between outdoor recreation and green infrastructure

Presenting author: Nora Fagerholm

Affiliation: Department of Geography and Geology, University of Turku, Finland, Finland

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Recent empirical research has confirmed the importance of green infrastructure and outdoor recreation to urban people's well-being during the COVID-19 pandemic. However, only a few studies provide cross-city analyses. We analyse outdoor recreation behaviour across four Nordic cities ranging from metropolitan areas to a middle-sized city. We collected map-based survey data from residents (n=469-4992) in spring 2020 and spatially analysed green infrastructure near mapped outdoor recreation sites and respondents' places of residence. Our statistical examination reveals how the interplay among access to green infrastructure across cities and at respondents' residential location, together with respondents' socio-demographic profiles and lockdown policies or pandemic restrictions, affects outdoor recreation behaviour. The results highlight that for pandemic resilience, the history of Nordic spatial planning is important. To support well-being in exceptional situations as well as in the long term, green infrastructure planning should prioritize nature wedges in and close to cities and support small-scale green infrastructure.

Keywords: crisis preparedness, human-nature relations, Public Participation GIS (PPGIS), spatial accessibility analysis, urban planning