



## BOOK OF ABSTRACTS

- I. SESSION DESCRIPTION
- II. SESSION PROGRAM
- III. ABSTRACTS

### I. SESSION DESCRIPTION

**ID: B5**

Mediterranean Islands' Ecosystem Services

**Hosts:**

	Title	Name	Organisation	E-mail
<b>Host:</b>		Ioannis Vogiatzakis	Open University of Cyprus	<a href="mailto:ioannis.vogiatzakis@ouc.ac.cy">ioannis.vogiatzakis@ouc.ac.cy</a> ,
<b>Co-host(s):</b>		Mario Balzan	Malta College of Arts, Science and Technology	<a href="mailto:Mario.Balzan@mcast.edu.mt">Mario.Balzan@mcast.edu.mt</a>

**Abstract:**

Mediterranean islands are hotspots of biological and cultural diversity, which, compared to their mainland counterparts, are more vulnerable to climate change, intense human activities, uncontrolled land use changes and financial crises (Balzan et al. 2018; IPCC 2019). Despite their importance and vulnerability, the biodiversity and ecosystem services management in islands is challenging both for the administrators, usually a mainland state, and the islanders themselves (Mercer et al., 2012). The range of contributions delivered to human societies by nature so-called “ecosystem services” (ES) have received increased attention during the last 15 years (MEA 2005; TEEB 2007; Haines-Young & Potschin 2018; Maes et al. 2014; IPBES- Diaz et al. 2015). Worldwide islands greatly depend on ES supplied by their land (e.g. freshwater provisioning, pollination) or the surrounding marine and coastal areas (e.g. food provision through fisheries) and supply important services that benefit society beyond their boundaries (e.g. lifecycle maintenance, recreation and tourism) (MEA 2005). Their limited size and natural resources i.e. freshwater, relative isolation and openness of their economies (highly sensitive to external shocks), limit their capacity to supply the required goods and services and meet domestic and external needs, making islands strongly dependent on imports and exports. Space constraint and, in many cases, resource availability, limits the adaptation capacity of islands ecosystems to climate change , the agricultural production but also the capacity to provide housing, infrastructure, waste disposal, industrial development, ultimately often leading to trade-offs between human uses and biodiversity conservation. Therefore, it becomes increasingly important for islands to be aware of their natural capital but also its condition, as well as the trends in biodiversity



conservation and ecosystem services flows, and how these may be threatened by changes due to internal or external biophysical and socio-economic drivers. For decision-makers and islanders alike, tourism is often seen as the core activity capable of reviving and sustaining local economies (Dorta Antequera et al., 2021; Singh et al. 2020). This also appears to be reflected in the scientific literature (Mazzola et al 2019) where most studies on island ecosystems and their services have focused on the management of island tourism or the environmental impacts of mass tourism and other human activities (Balzan et al. 2018) with limited attention to other ecosystem services, and to the development of a more comprehensive understanding of the links between ecosystem condition and structure and ecosystem services flows to communities. There is also limited literature on who benefits from island ecosystem service flows, and if these are more likely to give rise to spatio-social injustices in terms of access and interactions with nature.

#### **Goals and objectives of the session:**

The overall goal of the session is to analyze the state of the art of Ecosystem Services assessment on Mediterranean islands. Its objectives are to:

- Bring together contributions from Mediterranean islands and beyond
- Demonstrate the importance of islands as ES providers
- Evaluate the applicability of existing ES methodologies for island ES assessment.
- Within the context of recent research on ecosystem services, highlight particularities and the challenges of Mapping and Assessing Ecosystem Services in an island setting

#### **Planned output / Deliverables:**

The symposium is organized with the support of the B5 Mediterranean Working Group and seeks to attract researchers and practitioners to present new ideas regarding the assessment, monitoring and mapping of ES on an island setting. Besides its initial focus on Mediterranean Islands, it welcomes studies on other island settings with shared management challenges. During the symposium, we will discuss the advantages and shortcomings of existing ES approaches for island environments. It is envisaged to compile the contributions to the session in a Special Issue of an SCI journal. The symposium will be followed by an informal meeting of members BWG5 Mediterranean working group. The meeting is open to anyone interested in joining the group or interested in ecosystem services and biodiversity in the Mediterranean context.

#### **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:

[Biome Working Groups: BWG 5 – Mediterranean systems](#)

## 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
11:00	Ioannis	Vogiatzakis	Open University of Cyprus	Session Introduction
11:15	Vytautas	Narusevicius	Lithuanian Ornithological Society	Challenges of Ecosystem Services Assessment and Restoration in Small Islands of Inland Waters
11:30	Matilde	Schirru	National Research Council	Lived in, lived as, lived with, lived from: Asinara's island ecosystem services from the past to present in Asinara's Gulf local communities
11:45	Paraskevi	Manolaki	Open University of Cyprus	Reviewing the progress of Ecosystem Services assessment in Cyprus
12:00	Laura	Costadone	Finnish Environment Institute	Insights into nature-based recreation in a Mediterranean small island environment from crowdsourced data
12:15	Katerina-Shelagh	Boucoyannis	National Technical University of Athens	The importance of Ecosystem Services Assessment in Spatial Planning of islands: drawing from the study case of Nisyros



### Timetable speakers (Part 2)

13:30	Stalo	Leontiou	Open University of Cyprus	Spatial congruence between habitat quality and recreation in integrated coastal zone management
13:45	Paula	Antunes	NOVA University Lisbon	Assessing the impacts of LIFE Azores Natura 2000 project on ecosystem services
14:00	Michele	Lussu	University of Bologna	Factors affecting orchids distribution across the Central West Mediterranean Basin
14:15	Mario V	Balzan	MCAST; Ecostack Innovations	Planning for nature-based solutions in a Mediterranean Island context: insights from the case-study of Malta
14:15	Emmnouil	Kabourakis	Hellenic Mediterranean University	Improving ecosystem services, connectivity, and biodiversity of olive orchards with green infrastructure and sustainable farming practices, in Crete, Greece
14:30	Ioannis	Zografakis	Hellenic Mediterranean University	Green infrastructure and sustainable farming practices effect on flora diversity and provision of related agroecosystem services in olive orchards, in Crete, Greece

BWG 5 – Mediterranean Systems networking meeting (14:45 to 15:30)

### 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*

**B. Biome Working Group sessions: B5 – Mediterranean Islands' Ecosystem Services**

Challenges of Ecosystem Services Assessment and Restoration in Small Islands of Inland Waters





*Presenting author: Vytautas Narusevicius*

*Other author(s): Irena Mereskeviciene*

*Affiliation: Lithuanian Ornithological Society, Lithuania*

*Contact: narusevicius.vytautas@gmail.com*

Presentation is based on the project “LIFE Terns” (2018–2023) (dedicated to restoration and management of breeding grounds of the bird species of EU importance, the Little and Common terns) implementation in Lithuania and the assessment of impact of the Project activities on the small islands ecosystem services (ESS). The Project directly contributes to the implementation of the EU nature restoration targets, repeated in the EU Biodiversity Strategy for 2030.

Methodological issues appeared already in the beginning of assessment, when selecting the appropriate basic ecosystem for further identification of ESS to be monitored, considering the specificity of the target sites (small islands and sandy floodplains in inland water bodies), as well as the Project activities. The exercise was solved by selecting ESS, common to sparsely vegetated areas and dunes.

At first glance, the Project demonstrates commendable win–win results – activities keep waterways in good shape, at the same time restoring sandy islands’ ESS. However, considering, again, the specificity of expected Project impact and some already existing ESS overuse and disturbance practices in the Project sites, even the positive results of social survey of the potential use of ESS (main users – local community, inhabitants of surrounding municipalities and visitors of the Project areas on the national level) could not guarantee the expected outputs, e.g., the increase of sustainable use of improved cultural services.

Presentation is expected to foster, and contribute to, the discussions about the scaling and evaluation of restored ESS in novel cases, when areas contain of specific ESS, rare habitats and biodiversity, however, are small, thus, usually forgotten during the common ESS assessments in fresh water or wetland ecosystems, and are very sensitive to natural and human based impact, yet so far remain complicated from viewpoint of restoration, valuation, and conservational&use balance establishment.

*Keywords:* ecosystem services, small islands, ecosystem services assessment, restoration, inland waters

*2. Type of submission: Abstract*

[B. Biome Working Group sessions: B5 – Mediterranean Islands’ Ecosystem Services](#)



Lived in, lived as, lived with, lived from: Asinara's island ecosystem services from the past to present in Asinara's Gulf local communities.

*Presenting author: Matilde Schirru*

*Other author(s): Sabrina Lai, Laura Santona, Andrea Motroni*

*Contact: matildeschirru@gmail.com*

Ecosystem Services values represent how people perceive their living in, from, as, with Nature as recognized also in the 2022 report IPBES.

But what challenge for those areas and ecosystems where now local communities live elsewhere?

How did new relationships between people and Nature, local communities and their surrounding socio-ecological systems shape what is today a living and vibrant provider of ecosystem services today?

Asinara island, a 50-square kilometer island to the North-West of Sardinia, is here taken as a case study. Here small rural and fishermen's communities were banned at the end of the nineteenth century purely out of national interest, to build a lazaret first and an agricultural penal colony afterwards, hence deleting any community involvement, apart from the prisoners' and guards' one, for over a hundred years.

In this study we analyzed the results of a PPGIS survey, in which descendants from the original islanders' community were asked to identify the values they could recognize today in the island's ecosystems and their location, with a view to understanding which values thrive or survive and where, by comparing ancient and lost land uses versus current ones.

Results show there are different perspectives of Asinara island depending on interviewed communities: perceived values tell more concerning cultural identities from historical socio-ecological relationships but also allow to read how local communities benefit from Asinara island ecosystem services, harmonized that living in, from, as, and with under National Park rules.

This work synthesizes main outcomes of the GIREPAM project experience. GIREPAM – Integrated Management of Ecological Networks through Parks and Marine Areas, is a project funded by the EU Interreg Italy-France Maritime Programme and carried out between 2017 and 2021.



*3. Type of submission: Abstract*

**B. Biome Working Group sessions: B5 – Mediterranean Islands' Ecosystem Services**

**ASSESSING THE IMPACTS OF LIFE AZORES NATURA 2000 PROJECT ON ECOSYSTEM SERVICES**

*Presenting author: Paula Antunes*

*Other author(s): Rui Santos, Diana Pereira, Sol Heber, João Fernandes*

*Affiliation: NOVA University Lisbon, Portugal*

*Contact: mpa@fct.unl.pt*

The LIFE IP AZORES NATURA 2000 project, covering 41 Natura 2000 sites in the Azores Archipelago (Portugal), aims to promote the conservation of species and habitats protected by the Habitats and Birds Directives. It includes several actions such as the implementation of conservation measures for 24 species and 13 habitats protected by the Habitats Directive, the removal of invasive alien species, the implementation of ex-situ conservation actions, strengthening monitoring and surveillance capacities of local authorities and environmental education campaigns.

According to LIFE program regulations, all Natura and Biodiversity projects funded since 2011 are requested to include an assessment of their impact on ecosystems and their services. The research presented herein aimed at developing and applying a methodology to support such assessment for the LIFE IP AZORES NATURA 2000 project. Given the high number of different sites and the actions undertaken, there was a need to develop a customized evaluation methodology that could ensure the coverage of a diverse set of sites, while simultaneously measuring the impacts of the project on ecosystem services over time. This methodology is an adaptation of a SE mapping matrix-based approach (Burkhard et al., 2009), but using habitat type (instead of land cover) in each site as the basis for assessment and weighting the values in the matrix according to the condition of the habitat in each site, that will change over time as a result of the project's actions.

The methodology was applied for 2019 data, which is the base year, thus providing a baseline for evaluation. This assessment demonstrated how the ability of a Natura 2000 site to provide SE is limited by the ecological condition of the habitats present therein. The information generated through this methodology was complemented with field data for selected indicators for some ecosystem services. To capture impacts on cultural ecosystem services, a survey to visitors was also carried out to evaluate their motivations, perceptions



and behavior with regard to recreational and nature tourism activities and their connection with the actions developed under the project.

*Keywords:* Ecosystem services, indicators, habitats, LIFE Projects

*4. Type of submission: Abstract*

**B. Biome Working Group sessions: B5 – Mediterranean Islands' Ecosystem Services**

Insights into nature-based recreation in a Mediterranean small island environment from crowdsourced data

*Presenting author: Laura Costadone*

*Other author(s):* Mario Balzan

*Affiliation:* Finnish Environment Institute, Finland

*Contact:* [laura.costadone@syke.fi](mailto:laura.costadone@syke.fi)

Nature-based recreation is a key ecosystem service that people derive from landscapes and contributes to positive physical and mental well-being. At the same time outdoor recreation and eco-tourism can increase human pressure and negative impact on natural areas and biodiversity. Understanding people's preference for visiting natural settings and tradeoffs associated with environmental degradation can inform land-use planning and conservation management decisions. The widespread use of crowdsourced data offers a large source of information that can be used to gain a better understanding of people's favorite location to engage in nature-based activities. We investigated what type of nature experience, wildlife, or landscape sceneries are important to local and tourist people across the small island state of Malta during both the dry (April to September) and wet (October to March) seasons. We also identified potential environmental drivers of nature-based recreational activities. A content analysis of 41,839 images uploaded in Flickr between 2015 and 2021 was performed using the Google Vision machine learning algorithm to identify nature-based interactions. To complement Flickr information, we also explored patterns of nature engagements among people analyzing publicly available geolocated data from the iNaturalist citizen science community. A linear regression model identified coastal areas, protected sites and accessibility as significant environmental predictors of nature-based recreational visits. Different spatial clustering patterns also suggested some difference in the nature-based recreational preference between locals and tourists. Our results highlight the importance of assessing which ecosystem services or aspects of the environment are of public interest and should be prioritized in restoration and conservation efforts.





*Keywords:* Nature-based recreation, cultural ecosystem services, Flickr, iNaturalist, Google vision

*5. Type of submission: Abstract*

**B. Biome Working Group sessions: B5 – Mediterranean Islands' Ecosystem Services**

The importance of Ecosystem Services Assessment in Spatial Planning of islands: drawing from the study case of Nisyros

*Presenting author: Katerina-Shelagh Boucoyannis*

*Affiliation:* National Technical University of Athens, Greece

*Contact:* skboucoyannis@gmail.com

The paper draws on the hypothesis that landscape degradation and lack of climate change mitigation strategies in the islands of Greece are directly linked to local governmental policies toward agricultural production, energy planning, and sustainable management of ecosystem services. Greek rural, island communities and their landscape are left exposed to the effects of the climate crisis, lacking a holistic approach that could construct a resilient future. Through an overview of the existing spatial planning framework for the area, starting from the central government level and reaching the level of the regional government for the region of the Dodecanese, this paper aims to point out the major discrepancies in the planning framework as far as the ecosystem services are concerned and to trace the context of landscape degradation and the perspectives of resilience for island communities and their landscapes. The continuous degradation of island lands, apart from being an indicator of landscape vulnerability, highlights the discrepancies of a spatial planning framework that ignores the unique characteristics of the land, with important consequences for their sustainable development. This paper offers an alternative reading of island rural development, opposing the dominant narrative that traces all problems to the current economic development model of unsustainable tourism and the landscape degradation it usually implies. This argument is developed through the investigation of the capacity of the case study's soil to function as an ecosystem service. This study aims to highlight the importance of an inclusive, updated spatial planning framework that considers ecosystem services as a fundamental design principle to increase spatial planning effectiveness in tackling the problems raised by climate change.

*Keywords:* Ecosystem services, spatial planning, rural sustainability



6. Type of submission: Abstract

B. Biome Working Group sessions: B5 – Mediterranean Islands' Ecosystem Services

Spatial congruence between habitat quality and recreation in integrated coastal zone management

*Presenting author: Stalo Leontiou*

*Other author(s): Ioannis N. Vogiatzakis*

*Affiliation: Open University of Cyprus, Cyprus*

*Contact: stalo.leontiou@gmail.com*

Ecosystem services (ES) constitute the bridge that links humans to nature. The well-being of humanity critically depends on the delivery of goods and services from natural ecosystems. Especially for islanders, where their activity space is, by default, limited, the preservation of the ES should be a priority, as well as an asset towards the transformation of the relationship between the natural and the human world that is currently dominated by destructive and extractive activities. Furthermore, the physics shaping the interactions between land and sea in islands make ES particularly susceptible to changes linked with anthropogenic activities and climate change.

In this paper, we evaluate the spatial congruence between two contrasting ecosystem services namely habitat quality and recreation across coastal/marine Natura 2000 sites of the island of Cyprus. We used the relevant models in the INVEST software for mapping followed by spatial analysis in GIS to identify hot-spots and cold spots of congruence of these services.

The results show that habitats with high quality and high risk are located mainly along the coast and in areas where there is an increasing pressure due to the development of infrastructure related to urbanization or tourism, whereas tourist visitations are concentrated mainly along the island's coastline, particularly at the major coastal cities.

Our findings suggest that an integrated approach for the management of the coastal zone in an island context is essential, particularly for habitat conservation in order to safeguard the range of ES that they provide to the society. Our case study can be used as an example to build upon a common framework for the management of islandscapes.

*Keywords:* INVEST models, islands, Mediterranean, protected areas, tourism



*7. Type of submission: Abstract*

**B. Biome Working Group sessions: B5 – Mediterranean Islands' Ecosystem Services**

Reviewing the progress of Ecosystem Services assessment in Cyprus

*Presenting author: PARASKEVI MANOLAKI*

*Other author(s): Ioannis Vogiatzakis*

*Affiliation: ,*

*Contact: paraskevi.manolaki@ouc.ac.cy*

The concept of Ecosystem Services (ES) has gained considerable interest at the scientific, policy and societal level in the last 15 years. Mapping ES is essential to understand how ecosystems contribute to human wellbeing and to support policies which have an impact on natural resources. Despite the progress made at European level, Cyprus efforts on ES assessment are lagging behind. The paper discusses the progress made in Cyprus on ES assessment, through the LIFE-IP-PHYSIS. Although ES approaches have been implemented in the past, this is the only national wide attempt.

For the first time a National Scientific Advisory Board (NSAB) was established, responsible for the coordination of the Methodological Framework development, and Working Groups (WGs) for each major ecosystem type. A methodology was devised, specifically adapted to local conditions (e.g. ecosystem types, drivers, impacts, etc.). More specifically using the CICES framework the island ecosystems were classified into five broad types (forests & shrublands, phrygana/rangelands, agro-ecosystems, aquatic, coastal/marine), evaluating indicators for ecosystem condition, pressures and ecosystem services.

The ultimate goal is the use of the Cyprus National Ecosystem Assessment in order to provide a comprehensive framework for mapping and economic valuation of ES in the designated Natura 2000 sites throughout the island under different policy scenarios. Therefore, and in addition to the progress made at the island level, we also demonstrate selected case studies from Natura 2000 sites where ES assessment has taken place.

*Keywords:* Islands, Mediterranean, Natura 2000, LIFE+, Methodological framework



*8. Type of submission: Abstract*

**B. Biome Working Group sessions: B5 – Mediterranean Islands' Ecosystem Services**

Factors affecting orchids distribution across the Central West Mediterranean Basin.

*Presenting author: Michele Lussu*

*Other author(s):* Piero, Zannini, Riccardo, Testolin, David Dolci, Matteo, Conti, Stefano, Martellos, Alessandro, Chiarucci,

*Contact:* michele.lussu@unibo.it

Orchidaceae counts more than 28.0000 species worldwide and the vast majority of them are epiphytic and have a tropical distribution. Nevertheless, terrestrial species are the most threatened ones. Islands are like canvas where eco-evolutionary patterns paint unique and astonishing life forms and in the Mediterranean Basin, the insular biodiversity is particularly exposed to anthropogenic pressure as land management and tourism. Considered as one of ecology's few laws, the island species-area relationship (ISAR) is widely used to explain patterns of biodiversity distribution. Here, we investigate the insular biogeography of orchids across the Central West Mediterranean Basin an ecosystem shaped by multimillennials human activities. Although the relevance of this botanical family in the European flora and several studies conducted on their pollination syndroms, very few investigations are dedicated to its geographic distribution on islands. Focused on ISAR, we ask if islands with volcanic origin show lower species richness than expected by ISAR for those with a continental origin. We also investigate small island effect (SIE) and its relationship with pollination strategy. In order to promote the understanding of the insular natural capital of the Mediterranean Basin, we analyse which land use is related with orchid's occurrence, however, further studies are required to implement our knowledge of the flora distribution in a such biodiverse rich ecosystem. Our final list comprises 116 islands and 80 species and the preliminary findings suggests an high connection between mainlands and insular ecosystems reflected by the distributional patterns of these charismatic species. Further investigations are needed in order to define trends in biodiversity conservation.

*Keywords:* Biogeography, Island ecosystems services, Orchidaceae, Species Area Relationship,





*9. Type of submission: Abstract*

**B. Biome Working Group sessions: B5 – Mediterranean Islands' Ecosystem Services**

Planning for nature-based solutions in a Mediterranean Island context: insights from the case-study of Malta

*Presenting author: Mario V Balzan*

*Affiliation: MCAST, Malta*

*Contact: mario.balzan@mcast.edu.mt*

Nature-based solutions are increasingly promoted in regional and national policies because of their potential to provide multiple co-benefits while contributing toward multiple Sustainable Development Goals (SDG). However, various challenges remain, and recent reviews have identified the vague interpretation of NbS, the limited availability of examples of NbS implementation that includes stakeholder involvement, and the lack of quantitative and measurable targets or mandatory standards at the scale of implementation. This presentation provides an overview of recent work carried out in Malta to (1) map and assess urban ecosystem services, evaluate the implications arising from existing distributional patterns and (2) prioritise nature-based solutions that address existing inequalities in green infrastructure and ecosystem services capacity within the Valletta urban area in Malta. Finally, following a call for submission of NbS case-studies and the establishment of the ReNature NbS Compendium and Toolkit, which hosts 96 case-studies from Malta and a Mediterranean climate, and interviews with key stakeholders within the Horizon 2020 project ReNature, (3) we present here an analysis of the submitted NbS case-studies in Malta to evaluate current implementation of NbS and their impacts on ecosystem services, and assess how the implementation of NbS in Malta compares to other case-studies from similar climates. Results indicate that NbS were used to address multiple societal challenges, including tackling drought and heat risk, low place aesthetic value, low green infrastructure availability, and biodiversity and knowledge loss, simultaneously but implementation gave rise to a wider range of benefits. These observations are discussed in the context of existing barriers and opportunities to enhance NbS uptake through integrated, iterative, and multidisciplinary approaches.

*Keywords:* Keywords, Biodiversity, Barriers, Ecosystem Services, Enablers, strategic planning



10. Type of submission: Abstract

B. Biome Working Group sessions: B5 – Mediterranean Islands' Ecosystem Services

Improving ecosystem services, connectivity, and biodiversity of olive orchards with green infrastructure and sustainable farming practices, in Crete, Greece

*Presenting author: Emmanouil Kabourakis*

*Other author(s):* Ioannis Zografakis, Ioannis Chasourakis, Giannoula Bogka, Nikolaos Volakakis, Dimitrios Kollaros

*Affiliation:* Hellenic Mediterranean University, Greece

*Contact:* ekabourakis@hmu.gr

Agroecological or green infrastructure and sustainable farming practices provide a wide range of ecosystem services, while conserving biodiversity and increasing connectivity of fragmented natural areas. We research and develop agroecological infrastructure and sustainable farming methods that provide ecosystem services related to the provision of olive products and energy, maintenance of flora and fauna biodiversity and their services, soil conservation, fertility and health, reduction of pests and debases and polluting plant protection products, climate regulation and resilience to climate change, water quality and quantity, landscape conservation, aesthetics, and outdoor recreation. Ecosystem services are assessed with the use of indices, bioindicators and target species populations in fourteen pilot commercial olive orchards, under two different farming systems, conventional vs. organic. The orchards are located in plain and hilly agroecological zones in the Messara valley, Crete. Results demonstrate that agroecological infrastructure and sustainable farming practices application in olive orchards increase ecosystem services and contribute to the conservation of biodiversity, the sustainability of olive agroecosystems and the reduction of climate change effects. Findings show that agroecological infrastructure should be developed in collaboration with farmers, civil society, industry, and tourism stakeholders. It should be supported by the application of agricultural policies and be incorporated in regional/national certification schemes, as well as eco-tourism initiatives.

*Keywords:* olive orchard, green infrastructure, agroecosystem, agroecology, ecosystem service

11. Type of submission: Abstract

B. Biome Working Group sessions: B5 – Mediterranean Islands' Ecosystem Services

Green infrastructure and sustainable farming practices effect on flora diversity and provision of related agroecosystem services in olive orchards, in Crete, Greece.

*Presenting author: IOANNIS ZOGRAFAKIS*

*Other author(s):* Ioannis Chasourakis, Theodoros Vrachnakis, Nikolaos Volakakis, Dimitrios Kollaros, Emmanouil Kabourakis

*Affiliation:* Hellenic Mediterranean University, Greece

*Contact:* zografakisioan@hmu.gr

Ecosystem services provision is of vital importance for human wellbeing and survival. Public and policy makers awareness on ecosystem services importance should be enhanced in order agroecosystem services provision to be taken in mind during decision making. Agricultural land covered the 39.1 % of the total area in the EU in 2018 and olive growing is of great importance for Mediterranean countries. Sustainability of agricultural ecosystems can be assessed based on several ecosystem attributes and the related ecosystem services they provide. Biodiversity status is a crucial attribute of agroecosystems. Specifically, flora diversity is directly related to a high number of agroecosystem services such as soil fertility, pest management, climate regulation and resilience to climate change, water quality and quantity, landscape conservation, aesthetics and outdoor recreation. The importance of green infrastructure and agricultural practices on flora populations was studied in six paired conventionally and organic olive orchards. The orchards are located in the plain and hilly agroecological zones of the Messara valley, Crete. The results indicate the importance of agroecological zone, green infrastructure, and agricultural management on species of high importance in terms of services provision as well as on olive orchards floristic diversity. A network of sustainably managed olive orchards that incorporate green infrastructure elements should be developed in collaboration with farmers and policy makers to extend the ecosystem services provision and agroecosystem sustainability to the wider area as well as on national level. Industry and tourism stakeholders could further support ecosystem sustainability by promoting certified labelled products related to green infrastructure and plan agro-tourism visits in the olive orchards network.

*Keywords:* olive orchard, flora diversity, green infrastructure, agroecosystem services, ecosystem attributes