BOOK OF ABSTRACTS

SESSION DESCRIPTION

Session ID:
B5

Title of session:
Ecosystem services assessment in a Mediterranean context: challenges, methods, facts and solutions

Hosts:

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<th>Name</th>
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Abstract:

The five different Mediterranean-climate Regions, of which the Mediterranean Basin is the largest, globally harbor 20% of the plant species on less than 5% of the earth's surface. At the same time, this Mediterranean-climate zone is faced with several socio-ecological challenges, many of which are expected to increase towards the future due to pressures such as climate change impacts, increasing population numbers and degradation of ecosystems. An unanswered question is how the capacity of Mediterranean climate zone to supply ecosystems services will change towards the future and whether there are ways to address the existing and upcoming threats to wellbeing of its inhabitants.

Despite an urgent need to address these challenges, the Mediterranean challenges are not high on international environmental policy agenda. For instance, the existing list of indicators for the next reporting on the targets of the Convention of Biological Diversity contains no indicators that capture the impact of water shortage on biodiversity or related ecosystem services. Some of the Mediterranean challenges that are currently not well covered by commonly used ecosystem services assessments include for instance changes in the intensity of land-use, water shortages, fire risks, desertification and urbanisation.

With the Mediterranean challenges regarding biodiversity and ecosystem services data and knowledge missing from their scientific agenda, reports and assessments, other means are required to gather information to improve the supply of ecosystem services towards the future. One way to address this knowledge gap is to create more visibility and stimulate collaborations between colleagues working on environmental issues in the Mediterranean climate zone. The ESP Mediterranean Ecosystem services Working group is aiming at supporting this process by a number of activities.

The focus of this session will be on ecosystem services assessment in a Mediterranean context and to identify challenges, methods, facts and solutions. We invite colleagues working in a Mediterranean Climate region, to
present on the methodological challenges they encountered and how they propose to overcome them. The session will have presentations for the first half of the time, after which we will open the discussion to jointly design the research agenda of ecosystem services research in the Mediterranean climate biome.

**Planned output:**

To provide a basis for the discussion during the conference and also to prepare for a tangible output, a working document will be put together beforehand to allow for participation of new and existing working group members that cannot attend the conference. The working document focuses on how ecosystem services assessments might be improved, to be better suitable for including challenges from the Mediterranean climate zone, and further incentives for collaboration within the Mediterranean Ecosystem Services working group.

**Voluntary contributions accepted:**

Yes, everyone who is willing to contribute to the objective of this session is welcome to submit abstracts. However, we will limit our selection of best abstracts for oral presentation, to stay in the defined timeframe and ensure ample time for discussion.

**SPEAKERS**

**Invited speakers (if applicable)**

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<td>Ilse</td>
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**Poster presentations**

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<td>Economic valuation of ecosystem services provided by Mediterranean wetlands in terms of adaptation to climate change</td>
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Type of submission: Voluntary contribution

B5 Ecosystem services assessment in a Mediterranean context: Challenges, methods, facts, solutions

Interests and limitations of socio-economic valuations (of goods and services provided by ecosystems) for Sustainable Development in the Mediterranean

Presenting author: Nelly Bourlion
Other authors: Juliette Balavoine, Céline Dubreuil-Imbert, Antoine Lafitte, Didier Sauzade
Affiliation: UNEP – MAP – Plan Bleu, France
Contact: nbourlion@planbleu.org

Plan Bleu has gradually developed an expertise on socio economic valuation of ecosystem services across different ecosystems in the Mediterranean. This includes marine ecosystems with the study on socioeconomic impact of marine protected areas (Mangos and Claudot, 2013), as well as the study on the social and economic value of marine fisheries in the Mediterranean (Sauzade and Rousset, 2013), and the study on sustainable benefits from marine ecosystems (Mangos et al., 2010). The goods and services provided by forest ecosystems are also subject to a socio-economic assessment, in the following five countries; Algeria, Lebanon, Morocco, Tunisia and Turkey. Plan Bleu also took part of a local analysis (in Kerkennah archipeago) to evaluate role played by coastal ecosystem to mitigate climate change impacts on coastal zones. Finally, Plan Bleu has recently launched a new project focused on economic valuation of the ecosystem services provided by wetlands in terms of climate change adaptation in the Mediterranean.

Based on those studies and its expertise, Plan Bleu team has intended to develop an analysis on interests and limitations of such socio-economic valuation regarding sustainable development in the Mediterranean. This analysis emphasizes on the strengths and weaknesses in terms of communication towards decision-makers. Different goods and services studied across ecosystems are compared, as well as the several methodological approaches used in all Plan Bleu studies above mentioned. This analysis intends to give some recommendations on practical use of such socio-economic valuation.

Keywords: socio-economic valuation, Mediterranean, wetlands, forests, climate change
Socio-ecological systems in the Mediterranean region are very diverse and very complex, especially when we consider all countries in the Mediterranean environmental zone: i.e. European, African and countries from the Middle East. Performing an assessment of ecosystem services supply from these systems is therefore very challenging, but urgent as human well-being in region faces many threats. Among the threats affecting ecosystem service supply in the Mediterranean region, is the intensification of management practices which affects the supply of provisioning ecosystem services, causes declines in biodiversity and tends to reduce regulating and cultural ecosystem services.

In order to assess the supply of ecosystem services from agroecosystems, we identified three types of data regarding: i) land cover; ii) farming systems and iii) individual management practices in the Mediterranean region. In the spatial data mining several problems arose: such as data having different spatial and temporal resolutions, compatibility of a diversity of methodologies (e.g. use of different typologies), constraints or difficult access in order to obtain existing information and limitations owing to missing data in different territories.

In this study, we dealt with these problems by combining different methods, such as quantification of ecosystem services through a systematic review, using the outputs from an agroecosystem model (LPJmL) and incorporating knowledge from experts. This enabled us to obtain some first results on the supply and the synergies and tradeoffs between ecosystems services provided by agroecosystems around the Mediterranean incorporating different management options.

Keywords: Agroecosystems, land cover, spatial, data, ArcGIS
Ecosystem Services Assessment in a Mediterranean Context: Current and Future Methodological Challenges

Presenting author: Ilse Geijzendorffer
Other authors: Berta Martin–Lopez, Emmanuelle Cohen–Shacham and other members of the Mediterranean Ecosystem Services working group
Affiliation: CNRS –IMBE, France
Contact: ilse.geijzendorffer@imbe.fr

The Mediterranean environmental zone may have similar environmental conditions but it contains an enormous diversity of social–ecological systems. The five different Mediterranean–climate Regions, of which the Mediterranean Basin is the largest, globally harbor 20% of the plant species on less than 5% of the earth’s surface. At the same time, this Mediterranean–climate zone is facing several socio–ecological challenges, many of which are expected to increase towards the future due to pressures such as climate change impacts, increasing human population and habitat change. An unanswered question is how the capacity of Mediterranean climate zone to supply ecosystem services will change in the future and whether there are ways to address the existing and upcoming threats to wellbeing of its inhabitants.

Despite an urgent need to address these challenges, existing methods and indicators only partially capture the complexity of Mediterranean social–ecological systems and challenges. For instance, from the existing list of indicators for the next reporting on the Convention of Biological Diversity’s Aichi targets contains, none capture the impact of water shortage on biodiversity or related ecosystem services. Some of the Mediterranean challenges that are currently not well covered by commonly used ecosystem services assessments include for instance changes in the intensity of land–use, water shortages, fire risks, desertification and urbanisation.

In this presentation, we give an overview of the data and methodological knowledge gaps identified by partners of the Mediterranean Ecosystem Services working group that currently limit our possibilities to take stock of current ecosystem services supply, identify changes in ecosystem services flows and make of future projections.

Keywords: Assessments, drivers of change, indicators, Mediterranean region, trend
Due to methodological as well as data issues, information on the current and future supply of ecosystem services from Mediterranean socio-ecological systems is scarce, whereas simultaneously many threats to human well-being have been identified for the region. This study advances current knowledge by providing expert-based qualitative estimates of ecosystem services supply from ecosystems in the Mediterranean Basin.

Experts of Mediterranean ecosystems were asked to participate in a survey and to provide estimates for actual supply of ecosystem services. These estimates were used to develop a capacity matrix that was compared to a capacity matrix for Europe, to identify any differences in Mediterranean and European ecosystem services supply estimates. The qualitative estimates were combined with existing land cover data from 1990–2006 to obtain estimates for the recent trends in ecosystem services supply.

The Mediterranean capacity matrix showed overall lower estimates for the actual supply than the ones in the European matrix. This study provides a first indication of the ecosystem services status in the Mediterranean Basin, as well as the ecosystem services supply that may be threatened in the future. Main changes over time include the reduction of provisioning and regulating services, but the amplitude of the change, as well as the relative changes of services within a category differs between regions. Trends in cultural services were more diverse. Finally, we provide ideas for further research and suggestions to improve the current ecosystem services assessment methods, to better take into account the challenges of Mediterranean socio-ecological systems.

**Keywords:** Expert assessment, land-cover, capacity matrix, supply, trend
Israel's National Ecosystem Assessment: Challenges and preliminary findings

Presenting author: Alon Lotan
Affiliation: HaMaarag, Israel
Contact: alon.lotan@hamaarag.org.il

Two main biome types, Mediterranean and desert, characterize the land of Israel. However, the dense population, as well as development activities, are concentrated in the Mediterranean part, putting its biodiversity and the ecosystem services provided by the 'natural' ecosystems at risk. Agriculture, which has cultural importance to the Israeli people, is intensively practiced, mainly in that region, taking most of its area. In managing the rest of the Mediterranean grassland and shrubland human are also well involved.

The Israel National Ecosystem Assessment (I–NEA) project, which began at the end of 2013, was designed to increase Israelis awareness of the multifaceted value of nature and the human dependence on functioning ecosystems; and to assist managers, decision– and policy–makers to incorporate the value of ecosystem services and biodiversity into planning processes, land management and policy. In order to accomplish these goals a conceptual framework was established, the land and sea of the country were divided into six types of ecosystems (desert, sea, inland waters, agricultural, urban and Mediterranean) and a multidisciplinary professional assessment team was recruited. A stakeholder council, composed of representatives of various government ministries, municipalities, other authorities and NGOs, escorts the assessment work.

Throughout the assessment, we have faced various challenges. Due to the high aridity, regulation services related to water, e.g. regulation of water cycle and soil erosion, are of great importance in the I–NEA. However, there is a lack of data and models for evaluating these and other services. In addition, the relations between the relatively high biodiversity and the ecosystem services and benefits are also not well established, as well as the effects of important drivers of change, such as desertification and climate change. In this paper, I will present the I–NEA challenges and describe some preliminary findings.

Keywords: I–NEA, ecosystem assessment, Mediterranean, water regulation, agriculture
Comparing expert based capacity matrices with quantitative estimates of ecosystem services provided by Mediterranean forests

Presenting author: Philip Roche
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The use of expert based estimates of ecosystem services provision or demand is a widely used approach to obtain rapid estimates of ecosystem services based on the experience and the knowledge of some people on specific habitats or regions. The capacity matrices resulting from these estimates link habitats and/or land cover classes with the capacity of provision of ecosystem services. Despite methods that can be used to strengthen the robustness of scores derived from expert assessment, the quality of those scores and their relation with quantitative estimates are often criticized.

Quantitative estimates of several ecosystem services were compared with the scores of some available capacity matrices for Mediterranean forest ecosystem services. The results exhibit a positive correlation exists between the experts’s scores and the quantitative estimates. However, the scores also appear not to be linearly correlated with quantitative estimates. Expert scores mainly discriminate high values from low values. Another problem linked with the used of expert based capacity matrices is that scores are bound to a standard range of values, typically 0 to 5 or 0 to 10 while quantitative estimates ranges can be very variable between ecosystem services. Accordingly high scores doesn’t relates to the same quantity when comparing services.

This study confirms that expert based ecosystem services assessment and capacity matrices allows to have a quick and efficient assessment of coarse figures of ecosystem services provisions but that they also need to be related to quantitative estimates when a linear relation between scores and values is required or when quantitative values are needed to relate ecosystem services provision and demands.

Keywords: Capacity matrix, quantitative estimates, Mediterranean, forest, assessment
Optimizing the production of goods and services by Mediterranean forests in a context of global changes

Presenting author: Nelly Bourlion
Other author: Magali Maire
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Contact: nbourlion@planbleu.org

The forests of the five partner countries – Algeria, Lebanon, Morocco, Tunisia and Turkey – cover a total surface area of almost 19 million hectares. These woodlands contribute mainly to the fight against poverty, socio-economic development of rural areas, food security and cultural and recreational heritage. Mediterranean forests will be increasingly subject to human pressures and the effects of climate change. Therefore, deforestation and forest degradation will be significant in the MENA countries. This is even more evident than population are strongly dependent on forest ecosystems. The value of the services provided by the ecosystems must be better recognized, at the local, national and international level.

In this context, the French Global Environment Facility (FGEF) funded project aims at “maximizing the production of goods and services of Mediterranean forest ecosystems in the context of climate change”. This project is divided into 5 main components: (1) Integrate the impacts of climate change into forestry management policies and produce data and tools regarding both the vulnerability of forests and their ability to adapt (2) Assess the socio-economic values of goods and services provided by Mediterranean forest ecosystems (3) Improve modes of governance for Mediterranean forest ecosystems at territorial scale (4) Optimize and value the role of Mediterranean forests in climate change mitigation (carbon sinks), via the production of methodological tools (5) Promote coordination and sharing of experience between Mediterranean stakeholders via the Collaborative Partnership on Mediterranean Forests (CPMF).

This project is fundamental to provide concrete answers to forest managers while offering – and promoting on the international scene – a regional political and strategic reading of the sustainable management of Mediterranean forest ecosystems.

Keywords: Mediterranean forest, socio-economic valuation, participatory governance, vulnerability
Type of submission: Poster

B5 Ecosystem services assessment in a Mediterranean context: Challenges, methods, facts, solutions

Economic valuation of ecosystem services provided by Mediterranean wetlands in terms of adaptation to climate change

Presenting author: Céline Dubreuil-Imbert
Other author: Juliette Balavoine
Affiliation: Plan Bleu, France
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According to IPCC reports, climate change will have a significant impact on water resources in Mediterranean. It is expected, and already noted in some regions, an increase in extreme events (floods, heat waves, droughts, etc...) and risks in terms of economic losses and human lives. Adaptation and mitigation to climate change are therefore major challenges for water management in the Mediterranean.

While many studies on the impact of climate change on ecosystems already exist and are ongoing, it seems that, conversely, the study of the role of ecosystems as an adaptation tool is still largely to develop. However, ecosystems such as (undamaged) wetlands have (1) a direct role in climate regulation by reducing greenhouse gas emissions, and (2) a function of mitigation of climate change effects by providing protection against floods, droughts and coastal storms. Unfortunately, the role of ecosystems as natural adaptation infrastructures for storage and regulation of water transfers still does not receive the consideration it deserves in countries outside the EU. However, some data indicate that using the ability of nature to absorb or control impact in urban and rural areas can be a more efficient way of adapting than focusing on physical infrastructure. It is therefore important to consider the role played by ecosystems in climate change mitigation, and to fully integrate it in adaptation policies as well as the prevention of natural disasters.

The Med-ESCWET project on "the economic valuation of ecosystem services provided by wetlands in the context of climate change in the Mediterranean" aims to promote the adaptation based on ecosystems and to facilitate its integration in national climate change adaptation policies. To raise the awareness of policy makers on wetlands importance in adaptation to climate change, the project seeks to economically assess these services to inform decision–making process.

Keywords: Wetlands, climate change, Mediterranean, ecosystem services, carbon sequestration