

BOOK OF ABSTRACTS

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I. SESSION DESCRIPTION

ID: T4a

Mapping and assessment of ecosystem condition and relationships with ecosystem service supply

Hosts:

	Title	Name	Organization	E-mail
Hosts:	Msc.	Paula Rendón	Leibniz University of Hannover	rendon@phygeo.uni-hannover.de
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Abstract:

Action 5 of the EU Biodiversity Strategy to 2020 aims to improve the knowledge base of ecosystems and their services in the EU. It foresees that all Member States map and assess the state of their ecosystems and the services they supply in their national territory by 2014. Ecosystem state is also understood as ecosystem condition, which is the physical, chemical, and biological condition or quality of an ecosystem at a particular point in time. The condition of ecosystems as well as their spatial accessibility determine the capacity of ecosystems to deliver ecosystem services and to support human well-being. This implies that ecosystems in good condition ensure the long-term, high quality and sustainable delivery of ecosystem services.

However, changes in ecosystem condition caused by drivers and pressures such as climate and land use changes, pollution and nutrient load can impair the capacity of ecosystems to deliver services in sufficient quantity and quality. Therefore, it is essential to assess these pressures and their effects on the condition of ecosystems, so policy and decision-makers can design and implement suitable response actions. In addition, the assessment of ecosystem



condition is necessary to understand where ecosystems have degraded and should be restored. At the same time, it is necessary to understand the relationships between ecosystem condition and the delivery of services, in order to assess whether ecosystem services are maintained and enhanced.

This session welcomes abstracts reporting research and studies that quantify the condition of ecosystems at various spatial scales, discuss how ecosystem condition affects the capacity of ecosystems to deliver ecosystem services, and demonstrate how ecosystem condition and capacity are used in decision-making processes.

Goals and objectives of the session:

The overall goal of this session is to contribute to the understanding of the relationships between ecosystem condition and ecosystem services and its related applications in policy and practice.

The main objectives are:

- To increase our current understanding of how to define and quantify ecosystem condition and to identify knowledge gaps
- To demonstrate how the condition of ecosystems is a determinant of ecosystem service supply
- To discuss the potential of ecosystem condition mapping and assessment studies in contributing to policy and decision-making at different spatial and temporal scales.

Related to ESP Working Group/National Network:

Thematic working group: TWG 4 – Mapping ES

II. SESSION PROGRAM

Date of session: Wednesday, 9 June 2021

Time of session: 13:30 – 17:30

Timetable speakers

Time	First name	Surname	Organization	Title of presentation
13:30 13:35	Paula	Rendón	Leibniz University of Hannover	Introduction
13:35 13:50	Silvia	Rova	University Ca' Foscari of Venice	Relationship between ecosystem services' capacity and flow in the Venice lagoon: which implications for a sustainable management?
13:50 14:05	Ana	Lillebø	University of Aveiro	Assessing risk and vulnerability of coastal habitats to deliver ecosystem services: a socio-ecological Natura 2000 site as case study

Time	First name	Surname	Organization	Title of presentation
14:05 14:20	Kesenia	Merekalova	Lomonosov Moscow State University	Ecosystem services of wetland landscapes under land use change - a case study of Meshchera lowland, Central Russia
14:20 14:35	Aveliina	Helm	University of Tartu	Methods to quantify ecosystem condition in a country-wide assessment - Estonian approach
14:35 14:50	Natalija	Melovska	Macedonian Ecological Society	Mapping and assessment of ecosystem condition - MAES implementation in North Macedonia
14:50 15:05	Magali	Weissgerber	Université Clermont Auvergne, France	Ecosystem services and land use changes: a case study of forest expansion in a peri-urban area
15:30 14:45	Paula	Rendón	Leibniz University of Hannover	Linking ecosystem condition and ecosystem services: A MAES framework applied to European agroecosystems
15:45 16:00	Elisabeth	Prangel	University of Tartu	Effects of degradation and restoration on biodiversity and ecosystem services of semi-natural grasslands
16:00 16:15	Sebastian	Candiago	Ca' Foscari University of Venice	Analyzing vineyard landscapes and their ecosystem services under climate change
16:15 16:30	Elena	Bukvareva	Biodiversity Conservation Center	Biodiversity and ecosystem services help preserve each other: what does it mean for decision making at different spatial scales?
16:30 16:45	Philip	Roche	Inrae, France	Using ecosystem condition to modulate ecosystem services capacity matrix scores
16:45 17:00	Alessandra	La Notte	Joint Research Centre of the European Commission	At which stage condition characteristics can link to ecosystem services in the accounting framework? Few INCA-based examples at EU level
17:00 17:15	Catherine	Farrell	Trinity College Dublin, Ireland	What condition is your condition in?
17:15 17:30	Agnes	Vari	ELKH Centre for Ecological Research, Hungary	Alternative cascade models - suggestions and 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: T4a –Mapping and assessment of ecosystem condition and relationships with ecosystem service supply

Relationship between ecosystem services' capacity and flow in the Venice lagoon: which implications for a sustainable management?

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The lagoon of Venice is a complex social–ecological system where a set of different ecosystem services (ES) are provided, resulting from the multiple interactions between nature and society. Considering the diverse management challenges the lagoon is facing nowadays, ranging from climate change adaptation to nature conservation and economic development, it becomes crucial to understand how the ES provision is related to the functioning of the ecosystem. This work aims to explore the relationship between ES capacity and flow in the Venice lagoon. Capacity and flow indicators have been identified, quantified and mapped for 12 ES (four regulating and maintenance, four provisioning and four cultural ES), and have been summarized through a set of aggregated indicators, which include the sum of capacity, the sum of flow, and the ratio between flow's sum and capacity's sum. Overall, the aggregated capacity and flow appear to be positively related, confirming that the actual “use” of ES depends upon the ecological “potential”. The capacity is generally greater than the flow, which is reasonable if we consider the former as a sort of carrying capacity of the latter. However, few spots in the lagoon make exception to this, highlighting that the flow is not “only” sustained by the local capacity, but it may depend on a capacity that is lagged in time and/or space. Finally, we explored if and how the relationship between the aggregated capacity and flow indicators changes in different sub–basins of the lagoon. The results suggest that the strength of the relationship varies with different patterns and intensity of ES' use, becoming



weaker where the ES flow is characterized by a higher incidence of provisioning and cultural ES. These results are discussed in the perspective of a sustainable management of the lagoon social–ecological system.

Keywords: coastal ecosystems, sustainability, multiple ecosystem services, time lag, mapping

2. Type of submission: Abstract

[T. Thematic Working Group sessions: T4a –Mapping and assessment of ecosystem condition and relationships with ecosystem service supply](#)

Assessing risk and vulnerability of coastal habitats to deliver ecosystem services: a socio–ecological Natura 2000 site as case study

First author: Ana Genua–Olmedo

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The Ria de Aveiro (Portugal) is a Natura 2000 coastal lagoon that delivers essential ecosystem services, namely joy from tourism, food from fishing, and climate regulation. The spatial overlap of multiple pressures with the lagoon natural habitats and biodiversity threatens this socio–ecological system. Our main objective is to support ecosystem–based management (EBM) process, to balance the natural capital and human well–being. We applied the InVEST Habitat Risk Assessment model, an exposure–consequence framework that allows mapping the cumulative risk posed to habitats affected by stressors, and to explore the consequences for the delivery of ecosystem services. Coupled with expert judgement and stakeholder participation, we assessed the risk posed by the expected spatial distribution of seven human activities (recreation, services, aquaculture, agriculture, commercial development, environmental management and invasive alien species) in 2030, to five key biotopes (beaches and sand flats, mud flats, seagrass meadows, salt marshes, and small holdings with living edges named Bocage). Results showed that mud flats, salt marshes and seagrasses are more at risk than beaches due to unintended pressures from ongoing and foreseen environmental management options, in particular a high temporal duration of the dredging activities and flood control structures. The tourism and recreation stressor posed the greatest risk to mud flats, beaches and sand flats due to the high intensity of use for watersports, engines of



recreational boats and fishing. Invasive alien species posed the lowest risk to Bocage compared to the remaining biotopes, but with a high exposure due to a high overlap with a particular invasive alien plant species. The Regulation & Maintenance services showed the highest availability and vulnerability due to risk of habitat loss and fragmentation. This approach enables the prioritization of natural capital stocks and to establish the appropriate scales to implement policies (e.g., Habitats Directive) within EBM management cycles.

Keywords: coastal lagoon, Ria de Aveiro, natural capital, InVEST, ecosystem-based management

3. Type of submission: Abstract

[T. Thematic Working Group sessions: T4a –Mapping and assessment of ecosystem condition and relationships with ecosystem service supply](#)

Ecosystem services of wetland landscapes under land use change – a case study of Meshchera lowland, Central Russia

First author: Ksenia Merekalova

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Wetlands are of great resource and conservation importance. The reclaimed and currently abandoned areas of peat bogs are, on the one hand, a lost valuable resource of fertile lands, and on the other, they are the cause of fires and other destructive natural processes. A scientific assessment of the state and dynamics of the landscape functions of the transformed wetlands will help to create an optimal strategy for sustainable, adaptive and constructive land use and ecosystem management on a landscape basis. A lowland bog drained in 1966 in Central Meshchera, Ryazan region, Russia, was chosen as a model territory. The drained area was used for arable land and hayfields. In 1992 the cultivation of the fields was discontinued, the drained lands were abandoned and later included in Meshchersky National Park. To identify the spatio-temporal changes in the landscape-ecological functions of the model territory due to land use changes the key functions related to different types of ecosystem services were assessed – bioproductivity, climate regulation and biodiversity. The assessment of the spatio-temporal variability of ecosystem productivity for different stages of land use transformation was based on a combination of the dendrochronological method, determination of the



aboveground phytomass of herbaceous vegetation on sample plots and calculations of spectral vegetation indices. The assessment of the climate regulating function was carried out on the basis of the infrared channel of Landsat 5, 7, 8 transformations and the calculation of the landcover energy characteristics. The biodiversity supporting function was assessed using the InVEST model in terms of habitat quality for avifauna determined from the spatial structure of the landcover and land use. As a result a set of maps of various landscape–ecological functions for different chronological stages was obtained and their dynamics was revealed. This research was funded by the Russian Geographical Society (project No. 28/2020–I).

Keywords: landscape functions and services, land use change, biodiversity, bioproductivity, climate regulation

4. Type of submission: Abstract

[T. Thematic Working Group sessions: T4a –Mapping and assessment of ecosystem condition and relationships with ecosystem service supply](#)

Methods to quantify ecosystem condition in a country–wide assessment – Estonian approach

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In 2020, national large–scale MAES process was completed in Estonia (ELME project). Approach included country–wide and spatially explicit mapping of four major ecosystem types – wetlands, grasslands, agro–ecosystems, forests – and their condition. Coverage of ecosystems and their condition was mapped in 10x10m resolution, covering the whole land–area of the country, except urban areas and settlements. Across all ecosystems, condition was set to range from highest condition class A to lowest class D (in case of wetlands to E and in case of forests to F). For each ecosystem type, however, different indicators were used, depending on the availability of data and main drivers of ecosystem degradation. Indicators ranged from intensity of human interventions (logging, draining, habitat management) to landscape structure and woody species coverage. As a novelty, historical habitat coverage and habitat continuity was used as one of the indicators of ecosystem condition. Altogether, condition was



assessed for 42 ecosystem types covering in total 40 193 km². Highest condition classes, A–B class, were designated to ca 29% of area of all mapped ecosystems, C–class to 21% and D–class to 32%. E–class represented recently clear–cut forests or mined peatlands and covered ca 9% out of all assessed ecosystems. F–class represented forests in artificial soils (e.g. in mining areas) and this class covered 0.6% of all assessed ecosystems. For ca 9% of mapped land area, indicators were not with sufficient quality to assess ecosystem condition. The main challenge of mapping was the availability and validity of data, ranging from very recent and high–quality input to more fragmented and outdated data. Remote–sensing data was used to fill the gaps. Ecosystem condition maps directly informed some of the ecosystem services, but most notably are in the process of being used in land–use planning (e.g. planning conservation areas or assessing land–use trade–offs).

Keywords: ecosystem condition, remote sensing, grasslands, forests, wetlands

5. Type of submission: Abstract

[T. Thematic Working Group sessions: T4a –Mapping and assessment of ecosystem condition and relationships with ecosystem service supply](#)

Mapping and assessment of ecosystem condition – MAES implementation in North Macedonia

First author: Natalija Melovska

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In 2017, North Macedonia developed national agenda for assessment of ecosystems' condition. It announced the start of implementation of the targets set in the National Biodiversity Strategy and Action Plan in regards to ecosystem services assessments. The national team composed of 25 experts from different disciplines worked on the assessment followed the guidelines provided by MAES approach. In the first phase of the assessment process, the national team worked on accomplishment of the first two steps of the MAES operational framework: i) map the ecosystem types and ii) assess the condition of ecosystems. The ecosystem types were classified in three levels. The first two levels are in consent with MAES classification and 8 main ecosystem types have been identified, whereas the third level of classification is combination of EUNIS and CORINE which resulted with identification of 22 (sub)types. Mapping was done by using the available CORINE land cover data as well as



published and unpublished scientific data. Major work was done with additional analyses of satellite imagery which resulted in a detailed map of country's ecosystems. The assessment of ecosystems' condition was done for 15 natural and semi-natural ecosystem types. The anthropogenic and agricultural types of ecosystems were excluded from this assessment. In total, set of 24 indicators and 52 parameters were identified (referring ecosystem structure and function as well as anthropogenic pressures) and scored from 1 to 5 on specific scales. National and project data bases, as well as GIS tools were the main sources of data for the indicators and parameters. The majority of them were quantified, although some were evaluated based on their qualitative properties. This assessment was the first attempt for national implementation of MAES. It is followed by assessment on ecosystem services on national and local scale, accompanied by local scale implementation perspectives.

Keywords: ecosystem condition assessment, mapping, MAES, implementation, North Macedonia

6. *Type of submission: Abstract*

T. *Thematic Working Group sessions: T4a –Mapping and assessment of ecosystem condition and relationships with ecosystem service supply*

Ecosystem services and land use changes: a case study of forest expansion in a peri-urban

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Abstract text Changing land use and land cover (LULC) are expected to affect ecosystem services (ES) capacity by changing biodiversity and abiotic conditions related to biodiversity pattern. We investigate the pattern and extent of changes in LULC in a 170 km² large zone in central France which has undergone constant demographic growth during the last 70 years. This study aims at documenting the potential changes in ES capacity regarding 3 ES (carbon stock, soil fertility, soil sensibility to erosion). **Methods:** LULC maps were produced for the years 1946 and 2016. To investigate the effect of land abandonment, vegetation surveys and measures of ecosystem parameters supporting ES were conducted on plots experiencing forest



succession. Carbon stock in vegetation and soil was assessed. We measured soil composition and structure as proxies for soil fertility and sensibility to erosion. Maps indicate that the LULC changes were important, with wooded areas increasing of nearly 70% in 70 years, showing agricultural abandonment as a dominant process, together with urban expansion. Focusing on wooded post-cultural areas, we found they were composed by a diversity of succession stages where vegetation varies greatly regarding composition and structure. As for ES capacity, we observe an increase in carbon stock with successional stages, but carbon pools evolve differently. Soil composition and structure parameters respond heterogeneously to succession, some evolving steadily toward mature forest values, others staying close to grazed grasslands values. Results shows that LULC changed ES capacity. Agricultural abandonment and forest expansion modify the ES capacity of the study zone with a significant magnitude. Post-agricultural areas present a diversity of situations regarding ES capacity. Transitional stages between herbaceous cover and forest stages should be considered as distinct habitats with distinct ES capacities. Whether such capacities correspond to stakeholders' demand will be discussed.

Keywords: ecosystem services, land cover, forest expansion

7. Type of submission: Abstract

[T. Thematic Working Group sessions: T4a –Mapping and assessment of ecosystem condition and relationships with ecosystem service supply](#)

Linking ecosystem condition and ecosystem services: A MAES framework applied to European agroecosystems

First author: Paula Rendón

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We applied the operational framework suggested by MAES (Mapping and Assessment of Ecosystems and their Services in the context of the EU Biodiversity Strategies 2020 and 2030) for the integrated assessment of agroecosystems and the supply of the regulating ecosystem service control of erosion rates at European level. We quantified and mapped indicators for environmental and anthropogenic pressures, ecosystem condition and soil erosion control. We



explored the relationships between the respective indicators and the capacity of agroecosystems to control soil erosion across the different environmental zones in Europe. Our results indicate that in general, European agroecosystems have a high capacity to control erosion with some variations in the different environmental zones. Supply capacity was positively, negatively and not correlated with the various pressure and condition indicators. We also found that management and climate indicators play a significant role in the assessment of this service. These results highlight that conservational management practices are key to reduce soil loss and to improve agroecosystems condition. However, the design and implementation of such management practices must consider regional and local landscape characteristics, agricultural practices and stakeholders' opportunities and needs.

Keywords: ecosystem status, erosion control, pressures, condition indicators, agricultural soils

8. Type of submission: Abstract

[T. Thematic Working Group sessions: T4a –Mapping and assessment of ecosystem condition and relationships with ecosystem service supply](#)

Effects of degradation and restoration on biodiversity and ecosystem services of semi-natural grasslands

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Semi-natural grasslands and their diverse biota are currently most threatened by changes in land-use like abandonment of historical low-intensity management practices or conversion into arable land. Extensive loss of semi-natural grasslands consequently affects the ecosystem functioning and sustainable provision of ecosystem services. Our study focused on calcareous semi-natural grasslands in Estonia that have lost a large proportion of their historical coverage during the past century. Shrub encroachment and afforestation efforts have brought about significant decrease in local biodiversity and changed the accessibility to vital ecosystem functions and services. Thus, large scale restoration efforts were put into motion to halt and reverse the damage caused by degradation, to restore biodiversity and ecosystem functioning and to increase the livelihood of rural areas. To see the effect of overgrowing, we distinguished



three habitat condition stages of calcareous semi-natural grasslands before restoration: ‘open grassland’, ‘overgrown grassland’ and ‘afforested grassland’. We chose overall biodiversity maintenance, pollination, pest regulation, soil carbon storage, soil quality maintenance, forage quality and quantity, medicinal/wild food availability, recreational benefits, and conservation value as ecosystem services these grasslands support and potentially provide. We compared changes in biodiversity and ecosystem services before and after restoration. Our results show that, even though years of shrub encroachment and the afforestation campaign in the 1970s had caused significant decline in species richness and subsequent ecosystem service provision, degraded areas are still able to recover rather quickly after restoration. Considering that semi-natural grasslands are one of the most biodiverse ecosystems in European landscapes, restoration of such habitats potentially increases landscape multifunctionality and benefits agricultural production.

Keywords: land-use change, afforestation, shrub encroachment, grassland restoration

9. Type of submission: Abstract

T. Thematic Working Group sessions: T4a –Mapping and assessment of ecosystem condition and relationships with ecosystem service supply

Analyzing vineyard landscapes and their ecosystem services under climate change

First author: Sebastian Candiago

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Vineyard landscapes supply multiple provisioning, regulating and cultural ecosystem services. Many traditional wine-producing areas worldwide, however, are increasingly affected by climate change, which is undermining their capacity to deliver benefits to people. For this reason, it is critical to better understand the effect of climate change on vineyards ecosystem conditions and on the ecosystem services provided by these agroecosystems. Here, we use an analytical framework based on the MAES approach to carry out a systematic literature review on the causal flow of impacts between climate change, ecosystem conditions and ecosystems services in vineyard landscapes. We integrate this knowledge through network analysis,



identifying how vineyard ecosystem conditions are affected by climate change, and how this might undermine their capacity to deliver ecosystem services. In doing this, we highlight previously overlooked relationships and feedbacks between system components, pointing out knowledge gaps in the literature. From our results, it appears that research on vineyard landscapes has mostly focused on the consequences of climate change on grape production, while there is a lack of integrative studies that comprehensively include climate change impacts, ecosystem conditions and ecosystem services in vineyards. To fill this gap, future research on vineyard landscapes should adopt a more multifunctional and multidisciplinary perspective that considers the impacts of climate change on a wider range of ecosystem conditions and services. This will enable research and practitioners to have a holistic knowledge of vineyard landscapes, helping them to develop managements strategies that can support vineyard landscapes adaptation and the provision of multiple benefits under changed climatic conditions.

Keywords: viticulture, global warming, agroecological systems, ecosystem condition, network analysis

10. Type of submission: Abstract

T. Thematic Working Group sessions: T4a –Mapping and assessment of ecosystem condition and relationships with ecosystem service supply

Biodiversity and ecosystem services help preserve each other: what does it mean for decision making at different spatial scales?

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Biodiversity is a key factor in determining the mean level and stability of ecosystem functioning (EF) and ecosystem services (ES). However, relationships between biodiversity and EF/ES are different at different spatial scales. The causal effect of species richness on EF/ES is manifested in individual ecosystems where loss of species undermines EF. Thus, at single-ecosystem scale, decrease in alpha diversity is a direct indication of the need for conservation measures to maintain EF/ES. At landscape scale this causal relationship is modified by different local conditions. Landscape consists of various ecosystems (forests, grasslands, swamps, etc.), which are adapted to different conditions and have different optimal levels of biodiversity. For example, low-diversity peat bogs are not less valuable for



maintaining EF/ES than high-diversity forests of meadows. Moreover, landscape services require conservation of diversity of ecosystems. Thus, at landscape scale, threat indicators for EF/ES are decrease in alpha diversity within any type of ecosystem, decrease in beta-diversity within landscape and decrease in diversity of ecosystems. At regional or continental scale, causal relationships between biodiversity and EF/ES are clouded by correlations with climatic and geographic conditions over large areas. Negative and positive correlations revealed between biodiversity and EF/ES in the TEEB-Russia project (<http://teeb.biodiversity.ru/en/>) reflect not causal relationships, but the simultaneous reaction of indicators to changes in climatic conditions. For example, the negative correlation between biodiversity and water-related ES does not mean that biodiversity reduces ES performance. It shows that northern low-diversity ecosystems perform ES as efficiently as high-diversity southern ecosystems, but each under different conditions. Thus, at regional and continental scale, decision making to maintain EF/ES should consider low-diversity northern or arid ecosystems as important as high-diversity ecosystems from favorable geographic areas. It is also necessary to take into account geographical differences in the nature of the relationship between biodiversity and EF/ES.

Keywords: biodiversity, ecosystem services, spatial scale

11. Type of submission: Abstract

T. Thematic Working Group sessions: T4a –Mapping and assessment of ecosystem condition and relationships with ecosystem service supply

Using ecosystem condition to modulate ecosystem services capacity matrix scores

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Development projects and land planning have impacts (positive, negative and/or neutral) on ecosystem services by directly impacting ecosystems, their capacity to produce ES and the trade-offs between ecosystem services. One of the strongest determinant of ES capacity is the nature of land cover, accordingly LULC change have a direct effect on ES capacity. This can be fairly easily be taken into account using an ecosystem service capacity matrix. Nevertheless, some projects will have an impact on the state of ecosystems without changing their land use. In this case, it is important to consider the dependence of ecosystem services ecosystem state. Based on the literature results and tests, we propose to classify ecosystem services into 5 groups with different relationships to 2 types of condition indicators: first, the structural condition, which relates to the vigour and quantity of



ecosystems, and second, the biological condition, which relates to the specific, functional and spatial diversity of ecosystems. Based on tables modulating these two condition indicators into three states: weak, medium and strong, an ecosystem condition levels is obtained for each of the 5 group of ecosystem services: low, medium and high. These three levels will indicate whether, depending on the local ecosystem condition, a low, medium or high ES capacity matrix scores, previously defined should be used. This method allows to modulate ES capacity scores according to the ecosystem condition which is needed in numerous contexts where the ES values needs to be modulated according to ecosystem condition such as ES mapping and assessment or spatial.

Keywords: ecosystem state, capacity matrix, ES assessment, EIA

12. Type of submission: Abstract

T. Thematic Working Group sessions: T4a –Mapping and assessment of ecosystem condition and relationships with ecosystem service supply

At which stage condition characteristics can link to ecosystem services in the accounting framework? Few INCA–based examples at EU level

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There is a strict linkage between ecosystem condition and the services it provides. In accounting terms this linkage, although potentially there, is not explored. In fact, two different set of accounts are in charge to report and monitor ecosystem condition and ecosystem services. The former is reported in an asset account format, while the latter are reported as supply and use tables. Without a concrete linkage the two sets of accounts run in parallel: only an ex post correlation analysis can confirm (or not) a common path. On the other hand, a clear linkage could create a sequence that justify and support the statement that any change in ecosystem condition will affect services and in turn the benefits provided to economy and society. Concrete applications undertaken in INCA can demonstrate at which stage a direct connection can occur between ecosystem condition and ecosystem services accounting. The presentation considers the typology for ecosystem characteristics and ecosystem condition variables and input data in biophysical modelling of ecosystem services. The specific ecosystem services case studies concern in-situ soil retention, species maintenance and water purification.



Keywords: ecosystem condition, ecosystem services, ecosystem characteristics, in-situ soil retention, species maintenance

13. Type of submission: Abstract

T. Thematic Working Group sessions: T4a –Mapping and assessment of ecosystem condition and relationships with ecosystem service supply

What condition is your condition in?

First author: Catherine Farrell

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The INCASE (Irish Natural Capital Accounting for Sustainable Environments) project is piloting the UN System of Environmental and Economic Accounting (SEEA) – Ecosystem Accounting (EA) at catchment scale in Ireland. Working across four catchments, we are developing core SEEA-EA accounts to inform the process steps of ecosystem accounting in an Irish context, as well as highlighting data gaps and research needs that will contribute to wider discussions and refinement of the SEEA-EA approach. Work across the EU region to date has highlighted that condition accounts are the least developed of the four SEEA-EA core accounts. Given the link between condition of ecosystems, which reflects their ecological integrity and further underpins their capacity to sustain flows of ecosystem services, condition can be viewed as the critical factor from which to determine and inform sustainable use, and therefore requires considerable focus. We present an overview, based on the INCASE work to date, of the array of condition data available for the main ecosystem types in Ireland. We outline how the available data align with the three-stage process of condition accounting as set out in the SEEA-EA framework. Given the extent and occurrence of peatlands across the INCASE study catchments, and Ireland in general, we take peatlands as a focal ecosystem type to outline potential condition variables that could be developed to build a data framework for building condition accounts. We highlight the potential role of remote sensing, linking with expert ecological view, to streamline gathering and reporting of peatland condition. Building on our work around peatlands, we highlight next steps to explore focused condition data gathering across freshwater, woodlands, forest, grasslands, croplands, coastal and urban ecosystem types.

Keywords: catchment, condition, sustainable–use, peatlands

14. Type of submission: Abstract

T. Thematic Working Group sessions: T4a –Mapping and assessment of ecosystem condition and relationships with ecosystem service supply



Alternative cascade models – suggestions & discussion

First author: Agnes Vari

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Since the introduction of the cascade framework a huge number of ecosystem assessments used it to structure their work. The cascade framework intended to be indeed a 'framework', leaving room for individual interpretation and adjusted application. A few papers discussed its implications or suggested some minor modifications. The ES cascade framework seems to offer a simplified pathway of the flow of ES from nature to humans, however, there is no one-size-fits-all solution and different ES may rely on a different "enabling and appropriation" process, consisting of a different set of steps. If we want to assess and compare a set of ES at several levels of the cascade, it is important to find the appropriate levels, so that we don't compare apples with oranges. Furthermore, questions of sustainability can be better explored if the different levels are defined in a common and well-understood way. Here we present potential "alternatives" and ramifications to the simple cascade pathway, which gives the theoretic background to delineate different "ecosystem condition" levels, based on what is biophysically possible, what is sustained by the actually perceived condition, how this relates to ES potentials, up to where effects of climate change can be integrated. We would like to introduce this extended cascade framework and discuss it with the session participants.

Keywords: cascade framework, ecosystem condition, ecosystem service potential