BOOK OF ABSTRACTS

I. SESSION DESCRIPTION

ID: T17b-T17c

Moving forward in ecosystem services accounting: From the monetary valuation barrier to the mainstreaming into policy making/ Biophysical models for ecosystem accounting

Hosts:

	Title	Name	Organisation	E-mail
Host:		Alessandra La Notte	Joint Research Centre of the European Commission	alelanotte@gmail.com
Co-host(s):		Ioanna Grammatikopoulou	Joint Research Centre of the European Commission	ioanna.grammatikopoulou@ec.europa.eu
		Benjamin Burkhard	Institute of Physical Geography and Landscape Ecology, University of Hannover	burkhard@phygeo.uni-hannover.de
		Soile Oinoinen	Finnish Environment Institute	Soile.M.Oinonen@syke.fi

Abstract:

The sessions of the ESP Thematic Working Group 17 on Ecosystem Services Accounting & Greening the economy have walked a long way. Initial proposals (2017, 2018) were focused on concepts and methodology. Then (2019, 2021) it moved from theory to practice, by encouraging the presentation of concrete applications. This year, the session acknowledges that there is already a critical mass of knowledge on ecosystem accounting and aims to zoom into two specific areas of interest that need further elaboration: a. the monetary valuation of ecosystem services within ecosystem accounting scope, and b. the policy implementation through ecosystem services accounts.

In March 2021, the System of Environmental Economic Accounting – Ecosystem Accounting (SEEA EA) chapters 1 to 8 have been adopted as standard by the United Nations Statistical Commission. This important achievement concerns extent, condition and ecosystem services accounts in biophysical terms (chapters 1 to 8 in SEEA EA). The rest of the framework that refers to the monetary part of the ecosystem accounts (i.e. chapters 8 to 11) is just recognized but not adopted as an international standard. Certain concerns and knowledge gaps remain for the methodological applications in monetary valuation and for the policy relevance of terrestrial and marine ecosystem accounts. Hence, adoption of the full SEEA EA is pending.

On the one hand, this standard sets a milestone in the way ecosystems and ecosystem services gain (well deserved) room and importance within integrated accounting systems. The “experimental” phase is closed and now countries all around the world are legitimate to

test, apply and implement the international accounting standard.
On the other hand, two important components are left behind:
1. Ecosystem services accounts in monetary terms;
2. Mainstreaming of natural capital accounts into policy making

Goals and objectives of the session:

The first sub-session will focus on contributions of empirical studies that demonstrate the performance of monetary valuation methods for assessing specific ecosystem services. Findings of the studies should be presented in the context of terrestrial and/or marine ecosystem accounting, even if ecosystem accounting context is outside the scope of the study objective. The session will not cover methodological challenges per se (e.g. advanced econometric models). It rather aims to show how monetary valuation works in practice. The session will thus address the following questions:

- How did the selected monetary valuation method perform compared to other similar applications of the same method of assessing the same ecosystem services?
- How did the selected monetary valuation method perform compared to other valuation methods for assessing the same ecosystem service?
- How well did the monetary valuation method perform in relation to the biophysical assessment of the same ES (alignment of monetary to biophysical metrics)
- Are there certain indicators or criteria that can help us to decide whether the method is eligible for use in ecosystem accounting or not?
- Was the monetary valuation performed using certain tools (e.g. ARIES)? How did the tool perform?

The second sub-session on policy-making will welcome contributions that address case studies of terrestrial, freshwater and marine ecosystem accounting uses. Specifically, the mainstreaming of natural capital accounts into policy and private decision-making may concern:

- the integration of ecosystem accounts into already existing economic and financial tools which already have a well-settled course of action,
- the development of new tools that do not pass through the economic and financial conventional streams, or
- the role of both (settled and/or new) tools with respect to the transformative change that our society needs in order to tackle current crises.
- the potential of ecosystem accounts in demonstrating nexus (interlinkages) between sectoral policies e.g. water, food, energy, biodiversity

To demonstrate the usefulness of natural capital accounts remains a weakness of the whole system and seems to be one of the main reasons why many potential practitioners do not actively engage. We encourage particularly (but not only) submissions concerning transformative change, sustainable finance or integration with economic modelling.

Planned output / Deliverables:

Two kinds of deliverable can be proposed:

- a JRC technical report collecting all contributions for interested authors;
- a Special Issue/Topical Collection open to the session presenters.

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 17 – ES Accounting & Greening the economy

II. SESSION PROGRAM

ID: T17b – Moving forward in ecosystem services accounting: From the monetary valuation barrier to the mainstreaming into policy making

Date of session: 11 October 2022
Time of session: 11:00–12:30

Timetable speakers

Time	First name	Surname	Organization	Title of presentation
11:00–11–15	Sabine	Lange	Leibniz Universität Hannover, Institute of Physical Geography and Landscape Ecology	Challenges in Ecosystem Accounting: Solutions and lessons learned from EU member states
11:15–11:30	Marta	Sylla	Institute of Spatial Management, Wroclaw University of Environmental and Life Sciences	Spatial implications of ecosystem accounting at the local scale in support of governance
11:30–11:45	Anna	Addamo	European Commission – Joint Research Centre	Marine accounting in the Mediterranean Sea
11:45–12:00	Soile	Oinonen	Finnish Environment Institute	Piloting policy relevant ecosystem accounting of the Finnish freshwater ecosystems
12:00–12:15	Alona	Varukha	Institute of Geography of NAS of Ukraine, Chornobyl Radiation and Ecological Biosphere Reserve	Assessing the damage and monetizing the losses done to ecosystem services due to the russian war in Ukraine: the need for methodology development
12:15–12:30	Alessandra	La Notte	European Commission – Joint Research Centre	Ecosystem Services accounts as source of data for Sustainable Development policies. From descriptive statistics to composite indicators to input variable for economic modelling

ID: T17b – Moving forward in ecosystem services accounting: From the monetary valuation barrier to the mainstreaming into policy making

Date of session: 11 October 2022
Time of session: 13:30–15:00

Timetable speakers

Time	First name	Surname	Organization	Title of presentation
13:30–13:45	Domenico	Pisani	University of Foggia, Department of Economics	Applying Value Transfers in Ecosystem Accounting
13:45–14:00	Liisa	Saikkonen	Finnish Environment Institute (SYKE)	Finland's gone fishing for value: Application and review of methods to monetarily value recreational fishing for ecosystem accounting
14:00–14:15	Giorgos	Mallinis	Aristotle University of Thessaloniki, Rural and Surveying Engineering	Development of a transnational approach and integrated tools for mapping and economic valuation of forest ecosystem services in the Balkan Mediterranean region
14:15–14:30	Marta	Sylla	Institute of Spatial Management, Wroclaw University of Environmental and Life Sciences	Application of production function method to disentangle ecosystem contribution in agricultural production
14:30–14:45	Ana	Klinnert	European Commission – Joint Research Centre	Modelling ecosystem services in agro-economic models: the case of natural pest control
14:45–15:00	Ioanna	Grammatikopoulou	European Commission– Joint Research Centre	Moving forward in ecosystem services accounting: wrap-up of key messages

ID: T17c – Biophysical models for ecosystem accounting

Date of session: 11 October 2022
Time of session: 15:00–15:30

Timetable speakers

Time	First name	Surname	Organization	Title of presentation
15:00–15:15	Bruno	Smets	VITO	Biophysical modelling for European ecosystem accounting at Tier-2 or Tier-3
15:15–15:30	Stoyan	Nedkov	National Institute of Geophysics, Geodesy and Geography – Bulgarian	Modelling of flood regulation for ecosystem accounting

Time	First name	Surname	Organization	Title of presentation
			Academy of Sciences	

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: T17b - Moving forward in ecosystem services accounting: From the monetary valuation barrier to the mainstreaming into policy making

Finland's gone fishing for value: Application and review of methods to monetarily value recreational fishing for ecosystem accounting

Presenting author: Liisa Saikkonen
Other author(s): Miikka, Husa, Tin-Yu, Lai
Affiliation: Finnish Environment Institute (SYKE), Finland
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In Finland fishing is a major recreational activity and the Finnish recreational fishery data collection system is one of the most well-established data collection systems for recreational fisheries statistics in the Northern Europe. This study applies several monetary ecosystem service flow valuation methods to value inland and marine recreational fishing in different provinces of Finland and in Finland as a whole. The applied methods are included in the SEEA EA recommendations, and they are based on observed markets and market transactions, revealed expenditures, and expected markets. The data used for valuation consist of e.g regional data on recreational fish catches, fishers, fishing days and fishing expenditures, registry data on collected national fishery management fees, as well as data on the distribution of collected management fees to the owners of water areas in provinces. Further, existing travel cost models by Pokki et al. (2021) are employed to define fishing day demand functions for different provinces. Together with estimated fishing day supply specification, demand function allows the simulation of exchange value of fishing days, and simulation of effects on the accounting values, resulting from changes in market conditions or in policies affecting recreational fishing expenditures. The results and performances of valuation methods are compared with each other, and the causes for differences are examined. Finally, the eligibility of ecosystem service flow valuation methods for future ecosystem service flows required by ecosystem asset valuation are evaluated in the context of recreational fishing. The criteria for eligibility include e.g. the compatibility with bioeconomic models, and responsiveness of expected biophysical ecosystem service flows

and exchange prices to changes in ecosystem service management, demand and potential supply.

Reference: Pokki, H., Pellikka, J., Eskelinen, P., & Moilanen, P. (2021). Regional fishing site preferences of subgroups of Finnish recreational fishers. Scandinavian Journal of Hospitality and Tourism, 21(4), 442–457.

Keywords: ecosystem service valuation, natural capital, cultural ecosystem services, recreational fishing

2. Type of submission: Abstract

T. Thematic Working Group sessions: T17b – Moving forward in ecosystem services accounting: From the monetary valuation barrier to the mainstreaming into policy making

Modelling ecosystem services in agro-economic models: the case of natural pest control

Presenting author: Ana Klinnert
Affiliation: European Commission, Joint Research Centre, Spain
Contact: ana.klinnert@ec.europa.eu

Agricultural intensification in Europe has resulted in loss of biodiversity and degradation of ecosystem services. Within the Green Deal, the European Commission proposed an ambitious plan to promote biodiversity, including a reduction of 50% in pesticides use and highly toxic active ingredients by 2030. However, current models used for impact assessment to support EU policy are not able to address the complexity of the policy targets. For agro-economic models a necessary improvement is the integration of ecosystem services such as the possible positive feedback loops from agrobiodiversity to yields, as this should determine the application intensity of pesticides and the choice of active ingredients made by farmers.

We propose an innovative approach by linking an EU economic partial equilibrium model (CAPRI – Common Agricultural Policy Regionalised Impact) with ecosystem services modelling. We focus on two new components: i) a pesticides module (with pesticides use disaggregated down to the level of active ingredients), and ii) refined geospatial data on natural pest control potential. The effect of pesticides on yields is modelled through a damage avoidance function that is calibrated to observed applications, whereas the natural pest control map has been obtained with unprecedented resolution data on landscape features in agricultural areas. The two components are connected by investigating the significance of natural pest control to support yields. We expect that high levels of natural pest control allow farmers to rely on alternative control strategies, hence reducing the necessity of insecticide use.

The study highlights the economic implication of different semi-natural areas by assessing the regional supply of this particular ecosystem service on agricultural productivity. By identifying the economic and agricultural impact of a reduction or ban of insecticides, the analysis supports policy makers to set targets on pesticides reduction and encourages farmers to implement more sustainable pest management practices such as increasing landscape features.

Keywords: ecosystem services, natural pest control, pesticides reduction, economic impact assessment, CAPRI

3. Type of submission: Abstract

T. Thematic Working Group sessions: T17b - Moving forward in ecosystem services accounting: From the monetary valuation barrier to the mainstreaming into policy making

Ecosystem Services accounts as source of data for Sustainable Development policies. From descriptive statistics to composite indicators to input variable for economic modelling

Presenting author: Alessandra La Notte
Affiliation: Joint Research Centre of the European Commission,
Contact: alelanotte@gmail.com

The System of integrated Environmental and Economic Accounting- Ecosystem Accounts (SEEA EA) has been adopted as standard by the United Nations Statistical Commission in March 2021. There are three components for SEEA EA: Ecosystem Extent, Ecosystem Condition, Ecosystem Services Supply and Use Tables. The INCA (Integrated system for Natural Capital Accounting) project has completed in its implementation phase the Supply and Use Tables for nine Ecosystem Services. There are many ways to process the information provided by ES supply and use table. We can identify three main groups: (i) indicators which are derived from descriptive statistical data – they are characterized by the fact that any practitioner can use data without any further processing. A range of information can be extracted by the tables as they are; (ii) indicators which are derived through combining and processing descriptive statistical data – data extracted by SUT need to be further processed to obtain the desired outcome. The degree of complexity of each indicator can greatly vary. The outcome obtained is “final”; (iii) indicators which are derived through analytical work based on statistical data and methods – data extracted by SUT need to be further processed to obtain the desired outcome. In this case the outcome is not an indicator per se, but it represents an input for further computation. Skills concerning the tools/models where the ES accounting input will be used is a pre-condition. We will provide examples for these three cases with a special reference to the Sustainable Development Goals (SDGs).

Keywords: natural capital accounting, policy use, SDGs

4. Type of submission: Abstract

T. Thematic Working Group sessions: T17b - Moving forward in ecosystem services accounting: From the monetary valuation barrier to the mainstreaming into policy making

Application of production function method to disentangle ecosystem contribution in agricultural production

Presenting author: Marta Sylla

Other author(s): Konstantinos Chatzimichael, Ioanna Grammatikopoulou

Affiliation: Institute of Spatial Management, Wroclaw University of Environmental and Life Sciences, Grunwaldzka 55, 50-357 Wroclaw, Poland,

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According to the updated guidelines of the System of Environmental-Economic Accounting Ecosystem Accounting (2021) ecosystem services are the contributions of ecosystems to the benefits that are used in economic and other human activities. In this study, we attempt to assess the contribution of crop provision ecosystem service to agricultural production with the use of production function method. We assume that crop provision can be described and eventually captured by the following services related to agro-ecosystems, that is pollination, soil retention, pest control and green water. An economic production function model is employed to estimate the contribution of these services to total agricultural production. Finally, the contribution of crop provision is estimated as the summation of the detached services. The model is empirically applied to a panel dataset of 27 EU countries for the time periods 2000, 2006, 2012, and 2018 drawn from Eurostat. The empirical model relies on a Cobb-Douglas functional specification and is estimated using a random effects estimator that accounts for the panel nature of the dataset. Estimation results indicate that services considered in the analysis have a positive and statistically significant effect on EU agricultural production. Agricultural production is found to be more responsive to changes in soil retention and pollination services. Authors share the biggest challenges in the application of the method in ecosystem accounting, i.e. conceptualize the crop provision service and the relation to other regulating services, data availability and reliability and the impact of a disaggregation method. The results provide new insights to possibilities of disentangling the ecosystem contribution in line with the ecosystem accounting framework

Keywords: production function, ecosystem contribution, ecosystem accounting, SEEA EA, EU-27

5. Type of submission: Abstract

T. Thematic Working Group sessions: T17b - Moving forward in ecosystem services accounting: From the monetary valuation barrier to the mainstreaming into policy making

Applying Value Transfers in Ecosystem Accounting

Presenting author: Ioanna Grammatikopoulou
Other author(s): Robert Johnston, Alessandra La Notte
Affiliation: European Commission, Joint Research Centre, Italy
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Ecosystem accounting is a statistical framework that aims to track the state of ecosystems and ecosystem services, with periodic updates. This framework follows the statistical standard of the System of Environmental Economic Accounting Ecosystem Accounting (SEEA EA). The long-term aim of the SEEA EA is to integrate physical and monetary measures of ecosystems and ecosystem services (ES) by developing ecosystem accounts consistent with the System of National Accounts. In this paper, we argue that the Value Transfer method (VT) (also known as benefit transfer) is promising for facilitating and accelerating empirical applications of monetary valuation in ES, especially at the national scale and we demonstrate an empirical application of the method.

We demonstrate the application of VT for two ecosystem services; carbon sequestration and air quality. The VT for both services refer to a meta-analysis (MA) approach and thus our empirical application is realized by using a MA model. For carbon sequestration, we show the use of a MA model that estimates the relationship between temperature and climate damages. Then the value of carbon sequestration is estimated given the projections of certain temperature change and the anticipated CO2 emissions. For air quality, we show the use of a MA model that estimates the Value of Statistical Life (VSL) which is a measure of the willingness to pay for a mortality risk reduction. The change in mortality risk is determined considering a dose-response function and the estimate of the air quality indicator. The VSL welfare estimate is adjusted using the cost of illness approach. We summarize these outcomes in the light of mainstreaming VT in EA applications.

Keywords: value transfer, ecosystem accounting, meta-analysis

6. Type of submission: Abstract

T. Thematic Working Group sessions: T17b - Moving forward in ecosystem services accounting: From the monetary valuation barrier to the mainstreaming into policy making

Assessing the damage and monetizing the losses done to ecosystem services due to the russian war in Ukraine: the need for methodology development

Presenting author: Alona Varukha

Other author(s): ,

Affiliation: Institute of Geography of NAS of Ukraine, Chornobyl Radiation and Ecological Biosphere Reserve,

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A healthy environment and the ecosystem services it provides are the keys to human existence and a critical factor in achieving high levels of every kind of human and natural well-being. Disruption and damage of ecosystems result in failure to provide ecosystem services (ES) or deterioration of the quality of those provided. Studies on the negative effects of war on ecosystem services, assessment of the war-caused damage, and monetization of the ES losses are still in development. However, the rapid progress in this matter, as a result of the deployment of a full-scale russian war in Ukraine, is more relevant than ever, considering the volumes of damage and amount of funds needed for future restoration.

Since 2014, 7% (43 000 sq km) of Ukraine's territories were occupied by russia and as of today, after a full-scale invasion, – almost 21% (125 000 sq km). It is the territories of Latvia and Lithuania combined, or Bulgaria, Belgium, and Luxemburg.

The share of the nature reserve fund of Ukraine of the highest level of protection (national parks, natural and biosphere reserves), which was/is under the temporary control of the Russian invaders, is 44%. As per 4-the months of full-scale war, 100 000 ha of natural ecosystems within Ukraine's territories under Russian control burned. At least $12.4 trillion worth of Ukraine's energy deposits, metals, and minerals are now under Russian control.

The absence of universally recognized methods and procedures for assessing and monetizing the damage and losses caused to ecosystem services by military actions complicates the calculation of such damage and jeopardizes Ukraine's possibility of proving the amount of losses in court disputes and receiving financial compensation for nature restoration and elimination of russia's war consequences.

Keywords: ecosystem services, monetization of ES damage, Ukraine

7. Type of submission: Abstract

T. Thematic Working Group sessions: T17b - Moving forward in ecosystem services accounting: From the monetary valuation barrier to the mainstreaming into policy making

Piloting policy relevant ecosystem accounting of the Finnish freshwater ecosystems

Presenting author: Soile Oinonen
Other author(s): ,
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This paper applies the System of Environmental Economic Accounting – Ecosystem Accounting to the Finnish freshwater ecosystems following the EU typology on the ecosystem types. With the focus on lakes and rivers the study reviews the existing available data and models to produce extent, condition and ecosystem services supply and use accounts at the spatial scale meaningful for decision making. For the ecosystem services accounts, the review identifies avenues for developing monetary accounts as well. At regional scale, the paper addresses the development and application of ecosystem accounts at the River Basin District level to support the implementation of the EU Water Framework Directive. At national scale, the paper contributes to the development and reporting of two Sustainable Development Goals indicators: "6.3.2 Proportion of water bodies in good ambient water quality" and "6.6.1 Change in the extent of water-related ecosystems over time".

Keywords: Natural Capital, Water Framework Directive, Sustainable Development Goals, Ecosystem Accounting, Monetary Valuation

8. Type of submission: Abstract

T. Thematic Working Group sessions: T17b - Moving forward in ecosystem services accounting: From the monetary valuation barrier to the mainstreaming into policy making

Marine accounting in the Mediterranean Sea

Presenting author: Anna M Addamo
Other author(s): Alessandra, La Notte,
Affiliation: European Commission, Joint Research Centre (JRC), Italy / Museo Nacional de Ciencias Naturales, MNCN (CSIC), Madrid, Spain / Museo Nacional de Ciencias Naturales, MNCN (CSIC), Madrid, Spain / Climate Change Research Center (CCRC), University of Insubria, Italy
Contact: anna.addamo@ec.europa.eu

Seagrass habitats are essential and vulnerable ecosystems with several key roles, from biodiversity hotspots to climate change mitigation. Their characteristics, current condition and potential values are the main core of this study. Analysis of data retrieved from habitat modelling and scientific literature will be described, and the results will demonstrate and support the potential ecosystem services that seagrass habitats might provide in the four marine sub regions of the Mediterranean Sea. First attempt of marine accounting will be also presented under the INCA approach (operational procedure) and SEEA standards; specifically

the Supply and Use tables of fish and biomass provision, blue carbon and nature-based tourism. Finally, a conclusive discussion on the pivotal implementation of conservation, protection and restoration actions in the framework of European legislations will be displayed.

Keywords: ecosystem services, accounting, marine, seagrass, Mediterranean Sea

9. Type of submission: Abstract

T. Thematic Working Group sessions: T17b - Moving forward in ecosystem services accounting: From the monetary valuation barrier to the mainstreaming into policy making

Challenges in Ecosystem Accounting: Solutions and lessons learned from EU member states

Presenting author: Sabine Lange
Other author(s): Benjamin Burkhard, Adrián García Bruzón
Affiliation: Leibniz Universität Hannover, Institute of Physical Geography and Landscape Ecology, Germany
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The EU Horizon 2020 MAIA (Mapping and Assessment for Integrated ecosystem Accounting) Coordination and Support Action is coming to an end in 2022. In the last couple of years, MAIA aimed at mainstreaming natural capital and ecosystem accounting (NCA) within the 10 participating countries (nine EU member states (MS) and Norway) and beyond.

Within the presentation, we will focus on synthesizing the process of NCA implementation in Europe, reporting on the MS experiences, highlighting issues and challenges faced, indicating solutions as well as lessons learned. A list of four issues were mentioned and highlighted throughout the MAIA project repeatedly, namely (i) lack of policy support, (ii) lack of financial resources/ personnel, (iii) lack of technical skills/ knowledge and (iv) lack of data/ data access.

The MS' experiences with these issues and challenges are discussed and their progress in overcoming the issues is presented. Thereby, the focus lies on the identification and synthesis of the identified solutions and lessons learned. The synthesis highlights that shared learning has been promoted throughout project implementation, e.g. by exchanging experiences during workshops, organizing thematic sessions in order to share technical skills and/ or knowledge related to specific constraints or opportunities for implementing accounts. The vivid (international) cooperation and expert network of the MAIA community enabled many MS to move forward in mainstreaming NCA and to achieve progress in a variety of encountered issues and challenges. Nevertheless, extensive progress has been achieved by many EU MS, for some issues and challenges the progress is still rather limited, in particular when it comes to the issue "lack of data/ data access". We will present guidance and a list of concrete suggestions on how to best mainstream ecosystem accounting. More

precisely, we will propose a step-wise approach for mainstreaming of Ecosystem Accounting, aiming toward implementation and policy use.

Keywords: Natural Capital Accounting, NCA, MAIA Coordination and Support Action, issues, progress

10. Type of submission: Abstract

T. Thematic Working Group sessions: T17b - Moving forward in ecosystem services accounting: From the monetary valuation barrier to the mainstreaming into policy making

Spatial implications of ecosystem accounting at the local scale in support of governance

Presenting author: Marta Sylla

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The aim of the SEEA EA is to recognise the contribution of ES to economy and human well-being. The spatial aspect is in the hearth of each of the steps of the SEEA EA framework. The spatial perspective enriches the standard economic indicators that are used to describe the level of socio-economic development of the region or municipalities. This also poses a lot of challenges, especially in the integration part of the ecosystem accounting with economic activities. The aim of this contribution is to present the analysis of how the spatial character of the SEEA EA can be used to support local decision making. The case study area represents five municipalities that are part of the Ślęża Landscape Park in Poland. We mapped four ecosystem services and attributed them to the benefiting sectors. The ES included in the analysis are crop provision, water provision and regulation, nature recreation and aesthetic feature of the landscape. The socio-economic character of the case study is determined by the set of indicators, while the economic sectors are classified according to ISIC v4. The analysis relates to year 2012 and 2018. Thanks to the local character of our case study, we were able to spatially allocate the ecosystems and beneficiaries. We present in a spatially explicit ways the contribution of selected ES to local economy. We discuss the applicability of ecosystem accounting to spatial planning and local governance.

Keywords: SEEA EA, local scale, economic sectors

11. Type of submission: Abstract

T. Thematic Working Group sessions: T17b - Moving forward in ecosystem services accounting: From the monetary valuation barrier to the mainstreaming into policy making

Development of a transnational approach and integrated tools for mapping and economic valuation of forest ecosystem services in the Balkan Mediterranean region

Presenting author: Giorgos Mallinis

Other author(s): Irene Chrysafis, Giorgos Korakis

Affiliation: School of Rural and Surveying Engineering, Aristotle University of Thessaloniki, Thessaloniki, Greece,, Greece

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Balkan Mediterranean region harbors important natural forests and valuable Protected Areas in terms of their biodiversity and ecosystem services on which the majority of local communities still significantly depend. Assessment and valuation of regional forest biodiversity and ecosystem services consist a critical tool for the natural ecosystems protection. Further, stakeholder involvement in ecosystem accounting provides access to additional information about the relations between natural capital, ecosystem services and human wellbeing as well as promotes the conservation of natural resources. Demonstrating the total economic value of regional forest biodiversity and ecosystem services by developing monetary valorization approaches, expresses the relative importance of various ecosystem goods and services for populations, establishes indicators that can be used in decision-making processes, and subsists an essential step towards regional bioeconomy.

Within this framework, originally a common methodology was developed and adopted for the biophysical mapping and assessment of ecosystem services across four countries in the Balkan-Med region.

In addition, an online platrform (http://bioprospect.web.auth.gr/) was developed for the valuation of forest ecosystem services across the four countries. The on line platform includes a formal operational model developed through information collected from 150 questionnaires filled by residents of the region and two alternative quantitative (parametric and non parametric) multi criteria tools, in order to assess the Willingness to Pay for the ecosystem services over the study areas. The parametric multicriteria tools involve the methods of the Linear and the Tobit regression; the non-parametric multicriteria tools involve Linear Programming (LP) modelling. For the

In addition, a monetary valuation through biophysical indicators and the value transfer approach is also available.

Finally, the platform includes a webGIS sub-system as an e-learning module and an e-handbook for protected area managers and the public

Keywords: Biodiversity, webGIS, e-tool, biophysical mapping

12. Type of submission: Abstract

T. Thematic Working Group sessions: T17c - Biophysical models for Ecosystem accounting

Modeling of flood regulation for ecosystem accounting

Presenting author: Stoyan Nedkov
Other author(s): Desislava Hristova, Hristina Prodanova
Affiliation: National Institute of Geophysics Geodesy and Geography - Bulgarian Academy of Scienses, Bulgaria
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Flood regulation is one key regulating ecosystem service in ecosystem accounting. The accounting of flood regulation is based on the assumption that specific ecosystems can reduce the extent and intensity of floods, thus reducing the risk to build environments. Characterizing and assessing this ES is challenging because both assessment and accounts need various data which are usually not available through direct or indirect measurements. Therefore, modeling approaches that can provide data for different aspects of water cycles are much needed. There is a great variety of models and modeling approaches that deal with water regulation and each of them has its specifications, advantages, and disadvantages, the field of application and limitations, as well as specific data requirements. In this paper, we present a review of the models used in flood regulation mapping and make a critical analysis of their applicability for ecosystem accounting. The results reveal that SWAT is by far the most used model in the works published so far. We developed an approach that employs a combination of hydrologic modeling through ArcSWAT tool, GIS-based techniques, and ES assessment to produce flood regulation accounting in relatively small river basins. It enables to define the service providing areas (SPA) and service demanding areas (SDA), and the calculation of the actual flow which provides the necessary data to develop accounting tables. The critical point of the approach is the identification of the SPA based on the hydrological modeling results and how to determine the threshold value which outlines the SPA. Further steps towards the development of the approach for flood regulation accounting at a national scale are discussed.

Keywords: Hydrological modeling, ArcSWAT, SPA, SDA, actual flow

13. Type of submission: Abstract

T. Thematic Working Group sessions: T17c - Biophysical models for Ecosystem accounting

Modelling flood regulation services provided by vegetation

Presenting author: Alice Fitch
Other author(s): Laurence Jones, Tom Nisbet
Affiliation: UK Centre for Ecology & Hydrology, United Kingdom
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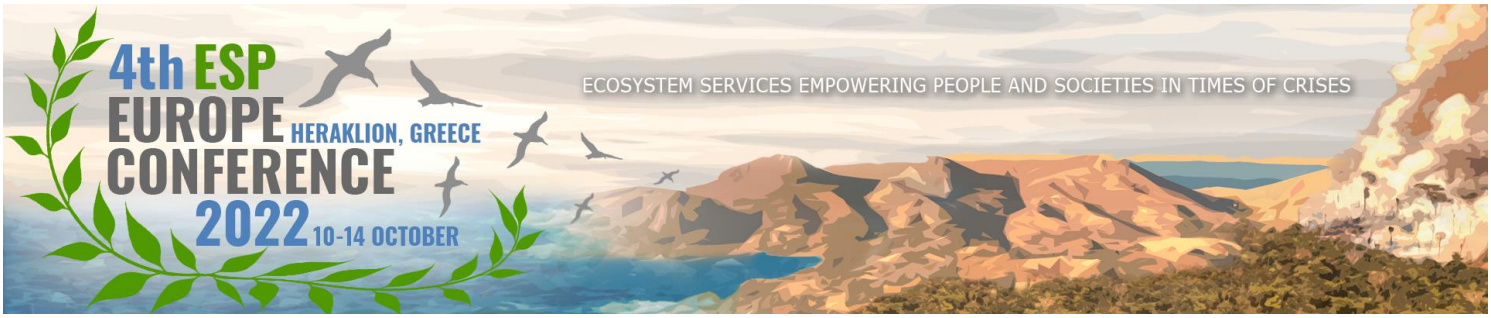
Local natural capital/NbS, particularly woodland, can have catchment wide impacts on flood regulation. The process of how woodland affects the generation and conveyance of flood waters is understood, however, modelling and quantifying this at a country level remains challenging. This is due to the complex interactions of climate, antecedent soil conditions, and location specific characteristics (i.e. elevation, soil type) amongst others that influence the ability of natural capital to provide a flood regulation service.

We have developed a spatial modelling approach for estimating the physical flood regulation service provided by natural capital through utilising outputs from the JULES land surface model. Estimates were based on three processes: estimating volumes of water intercepted by the woodland canopy, water storage within soil as result of woodland presence (prior woodland water use in days leading up to a flood event results in drier soils), and retention due to higher floodplain hydraulic roughness of woodland. These volumes of water are considered to be effective floodwater storage that would otherwise have to be provided if this natural capital was absent. We demonstrate that without natural capital (compared to a baseline of bare soil) an extra 6 to 11 billion m3 of water would have travelled downstream each year.

By constraining the analysis to catchments with downstream communities at risk from flooding, we were able to provide a monetary estimate of this floodwater storage based on the costs to provide the same storage volume through constructing and operating flood reservoirs (£3-£5 billion/year). These outputs are being utilised by UK government agencies for natural capital accounting, and we discuss how design of the modelling enables local and regional assessment of the wider impacts of tree planting. As well as our experience of parameterising biophysical models appropriately depending on service to be explored

Keywords: ecosystem service modelling, flooding, water storage, natural capital, tree planting



14. Type of submission: Poster abstract

T. Thematic Working Group sessions: T17c – Biophysical models for Ecosystem accounting

Biophysical accounting for selected ES provided by the Ślężański Landscape Park, Poland

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A healthy environment is essential for sustainable development, which in the time of crises is especially vulnerable. Therefore,., in line with the Sustainable Development Goals, the contribution of the environment to different economic activities is very important. . The aim of our work is to evaluate ecosystem services in the context of the System of Environmental-Economic Accounting Ecosystem Accounting at the local scale. The study area is the Ślężański Landscape Park. Located in the Lower Silesia region in Poland. This Landscape Park was founded to protect and preserve the natural and scenic environment of the Śleża massif, its cultural and historical values. Due to its unique character, the Park is a provider of diverse ecosystem services. The project identified a set of 4 ecosystem services: crop provision, global climate regulation and water flow regulation, recreation (1 provisioning, 2 regulating, 1 cultural). Each ES was developed following the Guidelines on Biophysical Modelling for Ecosystem Accounting (2022) and used either inVEST or ESTIMAP model. We share the biophysical modelling results as well as insights from modelling process to ecosystem accounting. Results are reported in tabular forms as well as in a spatially explicit way, i.e. on maps. We also provide feedback to the usefulness of the Guidelines in facilitating the modelling process

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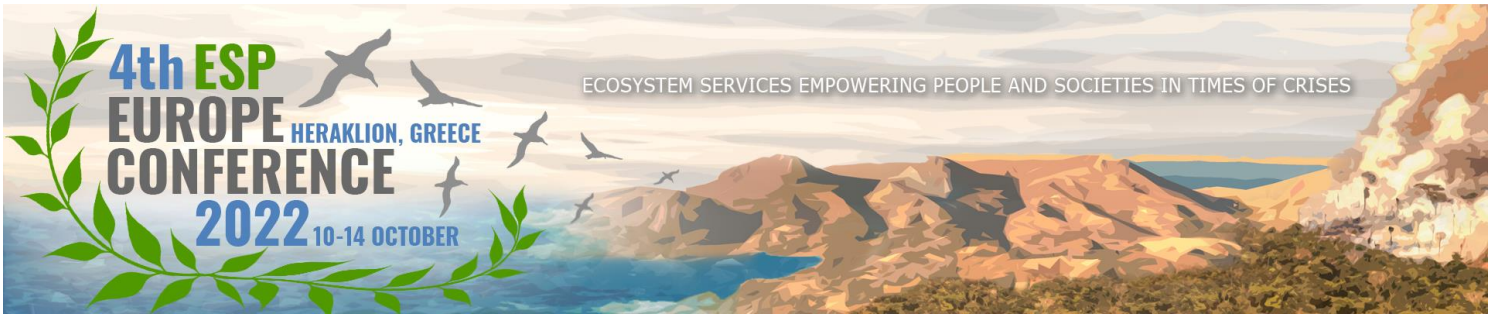
Biophysical modelling for European ecosystem accounting at Tier-2 or Tier-3



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The amendment of the EU Legislation (691/2011), proposed to the European Parliament and the Council, requests to start regular reporting on ecosystem accounts from the reference year 2024 onwards. These accounts follow the framework of the System of Environmental Economic Accounting (SEEA), and take benefit of the richness of data in Europe and compatibility with other EU reporting schemes, e.g. ecosystem assessments through Mapping and Assessment Ecosystems Services (MAES).

The INCA project of the European Commission and the EEA started in 2015 to develop ecosystem accounts for the EU. To support Member States in the creation of these accounts, the current phase of INCA aims to provide methodological guidelines and a QGIS plug-in tool to create Tier-1 and Tier-2 service accounts. Biophysical models are highly dependent on the availability and quality of input data. Data can vary between countries and therefore the models are parametrized from simple to complex. These data need to be prepared, which require a large geospatial expertise which is not always available in the reporting agencies, especially when moving to high spatial resolutions.

SEEA for Artificial Intelligence for Environment & Sustainability (ARIES) enables users to produce rapid, standardized and customizable ecosystem accounts using cloud services. This tool is primarily used to generate Tier-1 accounts, derived from public global datasets and not tuned to the European specificities. The PEOPLE-EA project targets to integrate the INCA models into the ARIES platform, prepare a European account ready data stack and integrate more observation data to ease the creation of Tier-2/3 accounts.

The presentation describes the INCA models, their parametrization and their data.

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