



## BOOK OF ABSTRACTS

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### I. SESSION DESCRIPTION

ID: T1

The ecosystem service classification challenge: experiences with CICES and other ES typologies in Europe

Hosts:

	Name	Organisation	E-mail
<b>Host:</b>	Bálint Czúcz	EC Joint Research Centre	balint.czucz@ec.europa.eu
<b>Co-hosts:</b>	Alessandra La Notte	EC Joint Research Centre	alessandra.la-notte@ec.europa.eu
	Benjamin Burkhard	Leibniz University Hannover	burkhard@phygeo.uni-hannover.de
	Jan-Erik Petersen	European Environment Agency	jan-erik.petersen@eea.europa.eu
	Claire Brown	UNEP-WCMC	claire.brown@unep-wcmc.org
	Steven King	UNEP-WCMC	steven.king@unep-wcmc.org
	Roy Haines-Young	Fabis Consulting	roy.haines-young@fabisconsulting.com

**Abstract:**

Categorizing and defining ecosystem services (ES) is the basis of any ES mapping, assessment or accounting activity. Widely accepted typologies supported by harmonized definitions are fundamental requirements for comparable and compatible studies. There are a large number of classifications proposed in the ES literature, several of them are used to various degrees in European ES assessments / accounting studies. Such classifications include the pioneering efforts of the Millennium Ecosystem Assessment (MA), the typology of The Economics of Ecosystems and Biodiversity (TEEB), the Common International Classification of Ecosystem Services (CICES), FEGS/NESCS used in the USA, or the IPBES system of Nature's Contributions to People (NCP). All these approaches aim to support systematic ES categorisation and comparison, and all of them come from a particular background, which favours specific contexts and goals.

The existence of different ES classifications is not surprising given the inherent complexity of human-environmental interactions and ES, historic developments and different contexts. There are several 'design options' to distinguish and define ES types, and order these types into a



hierarchy. A diversity of classifications can also be beneficial given the range of socio-ecological contexts, policy goals, etc. that needs to be addressed. On the other hand, the lack of a single 'default' classification makes comparisons and overviews difficult, and some of the conceptual design decisions can be difficult to interpret and apply in practical studies. Interpretation ambiguities and inconsistencies can then compromise the policy uptake and practical usefulness of the whole ES concept.

National, regional or local ES mapping, assessments and accounting studies can offer an important learning ground for the future development of ES classification systems, by connecting theory to practice. These practical studies typically rely on some of these big international classification systems, selecting the services thought to be relevant, but often also adjusting the list and customizing the nomenclature and underlying definitions. The primary goal of this session is to harvest knowledge related to the practical application of CICES and other major international classification schemes: what works and what does not work? The lessons learned can be a relevant resource for improving existing ES classification systems for the future.

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

The hosts of the session are the European members of the CICES Advisory Board, who want to initiate an exchange of experiences on the main issues and challenges surrounding ES classification systems, with a specific focus on CICES. For this reason, we invite presentations that

- present customized applications of CICES (or any other ES typologies) in a concrete ES assessment / accounting context (giving account of the challenges encountered and the solutions identified / proposed);
- discuss the conceptual challenges inherent to ES classification (preferably through concrete examples).

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

We will invite the session participants to a pre-conference preparatory activity through a web survey, the outcomes of which will be presented at the session.

At the end of the session, we plan to create a structured discussion on the main challenges and their potential solutions. Based on the quantity and quality of the abstracts received, we will also negotiate a special issue in a leading ES journal, which can host manuscripts developed around the topics presented and discussed in the session.

#### **Related to ESP Working Group/National Network:**

Thematic working group: TWG 1 – ES Assessment frameworks & Typologies

## II. SESSION PROGRAM

**Date of session:** Wednesday, 9 June and Thursday, 10 June 2021

**Time of session:** 11:00 – 12:00 and 13:30 – 15:00

### Timetable speakers Wednesday

Time	First name	Surname	Organization	Title of presentation
11:00 11:12	Alessandra	La Notte	Joint Research Centre of the European Commission	Types and typologies of ecosystem services for accounting purposes
11:15 11:27	John	Finisdore	Sustainable Flows	18 benefits of using ecosystem services classification systems
11:30 11:42	Martin	Dallimer	University of Leeds	Do ecosystem service frameworks represent people's values?
11:45 11:57	Kremena	Burkhard	Technische Universität Braunschweig & Leibniz University Hannover	Customising ES typologies for the needs of coastal protection and management at the German North Sea coast

### Timetable speakers Thursday

Time	First name	Surname	Organization	Title of presentation
13:30 13:42	Bastian	Steinhoff-Knopp	Leibniz University Hannover	CICES and soil-related ecosystem services: The challenge of representing soils in ES typologies
13:45 13:57	Ivo	Gasparini	Federal Office for the Environment	Forest Functions and Forest Ecosystem Services: the use of these concepts in forest practice in Switzerland
14:00 14:12	David	Castilla-Espino	University of Huelva	Cultural Ecosystem Services related to small scale fisheries in the EU Atlantic Arc: mapping and relevance in a multivariant framework
14:15 15:00				Discussion: Quo vadis ecosystem classifications? - Questions and Challenges



### 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: T1 – The ecosystem service classification challenge: experiences with CICES and other ES typologies in Europe

### **Types and typologies of ecosystem services for accounting purposes**

*First author:* Alessandra La Notte

*Affiliation:* Joint Research Centre of the European Commission, Italy

*Contact:* [alessandra.la-notte@ec.europa.eu](mailto:alessandra.la-notte@ec.europa.eu)

The classification of ecosystem services in CICES represent a coherent and consistent basis that can support a variety of uses and purposes. CICES structure in section, division, group and class is clear and comprehensive. However, for the specific purpose of ecosystem accounting, it would be important to consider an additional feature, that is “how” ecosystems deliver services. In a previous publication, five groups of ecosystem services, consistent with CICES classification, were identified: “source–provision”, “source–suitability”, “sink”, “buffer” and “information”. A critical element from an accounting perspective is that “source–provision” and “sink” services are characterized by (respectively) regeneration and absorption rates that can be exceeded in current use. The overuse may eventually lead to ecosystem degradation. For the remaining other groups of services, the absence of ecosystems able to provide a service does generate an ecosystem service unmet demand. In building capacity accounts these aspects are relevant. A step forward requires to deep into this initial grouping to identify key features that better explain the accounting features of ecosystem services and more clearly reconcile this additional layer of information to CICES. The proposal to be presented and discuss in this session involves four types and eight typologies of ecosystem services.

*Keywords:* ecosystem service classification, sustainability thresholds, capacity, overuse, unmet demand



## *2. Type of submission: Abstract*

T. Thematic Working Group sessions: T1 – The ecosystem service classification challenge: experiences with CICES and other ES typologies in Europe

## **18 benefits of using ecosystem services classification systems**

*First author:* John Finisdore

*Affiliation:* Sustainable Flows

*Contact:* John@SustainableFlows.com

Ecosystem services (ES) practitioners have been working to better define and measure how nature contributes to society. The Millennium Ecosystem Assessment's (MA) four types (i.e., supporting, provisioning, regulating, cultural) is the most widely used definitional grouping of ES, despite ecosystem services classification systems (ES–CS) being proposed by the European Environment Agency and the U.S. Environmental Protection Agency. These ES–CS employ final ecosystem services (FES) principles that are being used by leaders including the Chinese Academy of Sciences. Benefits of adopting formal ES–CS naturally proliferate when common definitions are applied among practitioners. Eighteen benefits are defined in five functional categories:

1. Unifying language within the ES community and with lay audiences;
2. Understanding how ES characteristics interrelate through the classification system's hierarchy;
3. Improved identification of metrics and analytical techniques from the specificity, completeness, and mutual exclusivity within a classification systems' hierarchy;
4. Ease of repurposing research especially for analytic techniques from benefits transfer to cost–benefit analysis and development of biophysical production functions;
5. Improved knowledge management within organizations that follows from a broader understanding of ES, their definitions, and interrelationships (Finisdore et al., 2020).

Analysis shows tremendous advantages from ES–CS versus the current “ad hoc” approach to defining ES (dominated by the MA's four types). ES–CS are an easy way to reduce the risk of double counting and to expand the interoperability of all ES research. The enabling conditions for wide adoption of ES–CS exist and the benefits far exceed expected costs of transitioning



to ES–CS. A movement toward a common understanding of FES, the principle that facilitates ES–CS, is underway. Advancing this trend through expanded use of ES–CS will reduce the cost of and barriers to ES research. This can expand the set of ES practitioners, helping ES become a common part of decision making.

*Keywords:* CICES, NESCS, classification, data, models

*3. Type of submission: Abstract*

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## **Do ecosystem service frameworks represent people’s values?**

*First author:* Martin Dallimer

*Other author(s):* Phoebe R Maund, Maximillian Nawrath, Solene Guenat, Katherine N Irvine, Robert Fish, Gail E Austen, Zoe G Davies

*Affiliation:* University of Leeds, United Kingdom

*Contact:* m.dallimer@leeds.ac.uk

A plethora of ecosystem service frameworks conceptualise links between the natural environment and society. The intended geographic scales of application, the policy/practice context, and the scientific disciplines involved have driven variations in how frameworks are constructed. However, all have largely been created based on expert opinions and views of how ecosystem services are structured. Here, we apply the Common International Classification of Ecosystem Services (CICES) in three different contexts (woodlands in Britain, urban greenspaces in Kathmandu, Nepal and in Lilongwe, Malawi) to examine the extent to which frameworks accurately capture people’s values. Our findings reveal several disparities. In all locations, people had nuanced and varied appreciations of the benefit that ecosystems provide and cultural ecosystem services were strongly valued. In British woodland, this was reflected in a more refined understanding of recreational uses. In contrast, the considerable refinement and specificity provided by CICES for some provisioning, regulating and maintenance services did not align with public values, which were more generalised. In Kathmandu, there was a greater emphasis on potential sources of harm from ecosystems, and the role of nature in the spiritual and religious aspects of people’s lives. In



Malawi, cultural and regulation and maintenance ecosystem services were most frequently mentioned, despite the use of greenspaces by many for provisioning services. However, people also identified an additional suite of economic and societal benefits that did not directly map onto ecosystem service frameworks. Across all case studies, we further demonstrated differences in values explained by social characteristics (e.g. ethnicity, gender, societal role) that need to be accounted for in decision-making processes. Moving forwards, we need to consider how society views the services derived from nature and reflect ecosystem service frameworks to ensure ecosystem service approaches are effective, transparent and widely supported.

*4. Type of submission: Abstract*

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## **Forest Functions and Forest Ecosystem Services: the use of these concepts in forest practice in Switzerland**

*First author:* Ivo Gasparini

*Other author(s):* Andreas Bernasconi, Clémence Dirac

*Affiliation:* Federal Office for the Environment (FOEN), Switzerland

*Contact:* [ivo.gasparini@bafu.admin.ch](mailto:ivo.gasparini@bafu.admin.ch)

The concept of Ecosystem Services (ES) is gradually being incorporated into European policy and practice. Many questions arise about how to operationalize and apply this concept to problems at different scales and in different policy sectors. The term Ecosystem Functions (EF) has been broadly used in ecology and related disciplines. There are primarily two approaches to this concept. One is purely analytical and refers to EF as a subset of processes that operate within a particular ecological system. The second one is more practical and refers to EF as links between ecological processes and human well-being. Incorporating the human component within the concept of EF can be complex because it increases overlap between EF and ES. Forest Functions (FF) are a typical example of a practical approach to the EF concept that includes a human component. In Switzerland, FF have evolved to become a fundamental element in forest planning and management in order to provide various goods and services, and as such were established



in the federal act on forest in 1991. Nonetheless, in recent years, typical elements of the ES concept have been introduced into the Swiss forestry sector, connecting ES theory to practice. This leads to an improvement to the notion of FF, which can take advantage of the existing ES knowledge, approaches and instruments. For future work, it is however important to clarify and harmonize the concepts and to define their methodological frame of reference. Based on literature research and expert interviews, the authors shed light on these concepts and their current uses in forest practice in Switzerland. They also compared current FF and ES classifications. This project lays the groundwork for the harmonization of FF and ES and is thus a step for further implementation of the ES concept in the Swiss forestry sector.

*Keywords:* forest functions, forest ecosystem services, Switzerland

*5. Type of submission: Abstract*

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## **CICES and soil-related ecosystem services: The challenge of representing soils in ES typologies**

*First author:* Bastian Steinhoff-Knopp

*Other author(s):* Carsten Paul, Katharina Helming, Tinka K. Kuhn, Peter Weißhuhn

*Affiliation:* Leibniz University Hannover, Germany

*Contact:* steinhof-knopp@phygeo.uni-hannover.de

Soils provide the basis for terrestrial plant growth and thereby the foundation for numerous ecosystem processes, functions and services contributing to human well-being. The strong linkage between ES and soils is emphasised in many publications (e.g. Dominati et al. 2010) and creates a strong foundation for e.g. soil conservation strategies or impact studies. The Common International Classification of Ecosystem Services (CICES) 5.1 defines 83 ES classes, of which only some are relevantly affected by soils. However, the CICES typology lacks a comprehensive consideration of soil and its properties, processes and functions. Based on a literature review we compiled two subsets of CICES classes: soil-related ES (29 service classes) and ES affected by agricultural soil management (40 service classes) (Paul et al. (2020). We also identified



constraints, such as overlaps, gaps, and highly specific or very broad class definitions. On the one hand, the integration of non-living processes in soils relevant to the co-provision of ES is largely not considered in CICES. On the other hand, CICES strictly distinguishes between services provided based on biotic and abiotic processes. In soils, many services are based on complex integrated organic and inorganic processes which cannot be separated to define individual biotic and abiotic ES. In our presentation, we will highlight the identified constraints, suggest additions and present the two developed subsets. The concept of subsets can also be used to define thematic layers of CICES relevant for sectoral/specific impact assessments.

*Keywords:* CICES, ES typologies, soil, soil-related ecosystem services

*6. Type of submission: Abstract*

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## **Customising ES typologies for the needs of coastal protection and management at the German North Sea coast**

*First author:* Kremena Burkhard

*Other author(s):* Daniela Kempa, Maike Paul, Evke Schulte-Guestenberg, Leena Karrasch

*Affiliation:* Technische Universität Braunschweig, Institute of Geoecology, Braunschweig, Germany; Leibniz University Hannover, Institute of Environmental Planning, Hannover, Germany

*Contact:* burkhard@umwelt.uni-hannover.de

Existing established ES typologies provide a robust basis for research and methodological work but can also be obstructive when very case-relevant objectives are being addressed. The same applies for transdisciplinary work, where complex typological systems can be overwhelming for the involved stakeholders. However, very generalised and communication-oriented typologies can be limiting for the scientists, especially in quantitative indicator-based ES research. The project Gute Küste Niedersachsen focuses on the development of pathways for nature-based coastal protection at the German North Sea coast through ecosystem strengthening coastal management in the context of climate change and increasing threats to the coastal area. For that purpose, an ES typology was developed that 1) is applicable by the involved scientist with different



backgrounds and 2) is easy to communicate with non-researchers. Three established ES typologies were initially selected for discussion – CICES, IPBES NCPs, and the typology developed by Böhnke–Henrichs et al. (2013) for marine spatial planning and management. All science partners were asked to fill in a matrix for each ES typology answering two questions: 1) Which ES do you consider as relevant for the project aims and objectives in the chosen case studies? and 2) Which ES are you able to measure and analyse? To select an eligible typology and define and structure the ES, an iterative process was undertaken. It was decided that the CICES classification provides the best basis to address the project needs and is the most inclusive for the planned research activities. The CICES classes that were identified as relevant and measurable were re-clustered and renamed in order to represent the area specific problems and objectives in a way suitable for communication with stakeholders and civil society. Herein is presented the process of customisation and development of the ES typology and insights on the results and implications of this effort.

*Keywords:* ES typology, case-specific, relevance and measurability, CICES, clustering

*7. Type of submission: Abstract*

[T. Thematic Working Group sessions: T1 – The ecosystem service classification challenge: experiences with CICES and other ES typologies in Europe](#)

## **Cultural Ecosystem Services related to small scale fisheries in the EU Atlantic Arc: mapping and relevance in a multivariant framework**

*Presenting Author:* David Castilla–Espino

*First author:* Juan–José García–del–Hoyo

*Other author(s):* Celeste Jiménez–de–Madariaga

*Affiliation:* University of Huelva, Spain

*Contact:* david.castilla@dehie.uhu.es

The enhancing of the value of Small Scale Fisheries (SSF) requires providing tools and resources for the design and assessment of community–led local development strategies, which serve as a means for promoting social well–being in coastal communities. The latter requires proper accounting of the importance/value of fisheries taking into account not only food provision



services, but also supporting, regulating and cultural services. Cultural services are closely related to concept of cultural heritage given that the latter focuses on the elements instead of the benefits representing the origin of the benefits. Proper valuation of Cultural Ecosystem Services requires the identification, classification and mapping of different cultural heritage elements related to cultural ecosystem services. This paper uses a georeferenced database of documents and the collection of audio, image and video documentation on SSF and its ecosystem cultural and natural heritage that includes different categories of cultural heritage elements (CH) according UNESCO and other specific thematic classifications. The database includes 1087 documents of Intangible Cultural Heritage, 396 documents that describe Tangible Cultural Heritage; and 83 documents related to NH along the Atlantic Area of the EU (Spain, Portugal, France, UK and Ireland). Eleven binary variable representing categories of the references/documents included in the database has been reduced to five independent factors and classified into 5 groups describing the main patterns of Atlantic Area Cultural Heritage related to SSF using multivariate analysis. The distribution of entries of the database per group of membership and country allow concluding that there are 5 groups of elements with different representativity across countries along the Atlantic Area of Europe. These results allow identifying the most important source of cultural services related to SSF in the Atlantic Area of the EU and the areas / coastal communities (NUT1–NUT3) where cultural services and their associate cultural heritage element are especially important. Funded by European Union’s Interreg Atlantic Area European Regional Development Fund in the framework of CABFishMAN project. (EAPA\_134/2018).

*Keywords:* small scale fisheries, cultural services, cultural heritage, atlantic area, Europe