SESSION DESCRIPTION

ID: T17c

Advancing the natural capital accounting: connecting the dots between ecosystem extent, condition, and services

Hosts:

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Abstract:

Natural Capital Accounting (NCA) is emerging as a foundational framework for guiding international policy and sustainability goals. It underpins major global initiatives such as the Kunming-Montreal Global Biodiversity Framework (GBF), the Sustainable Development Goals (SDGs), and the Global Goals on Adaptation (GGA). By integrating and structuring data on ecosystem extent, condition, and ecosystem services (ES), NCA offers a more holistic approach than the traditional ES biophysical supply assessment narrative.

Despite NCA's strengths, the links between ecosystem extent, condition, and service outcomes remain fragmented—particularly in how they are captured across monetary and non-monetary valuations, and across temporal, spatial, use and other stakeholder dimensions. This disconnect poses challenges for consistent monitoring and policy alignment.

The GBF is one example of a framework which could be enhanced through better integration of ecosystem condition monitoring. The A2 indicator "Extent of Natural Ecosystems" tracks the proportion of the Earth's surface covered by natural and semi-natural ecosystems, offering insights into biodiversity trends and land-use change. The indicator is linked to B1 "Services provided by ecosystems". However, in this process there is no assessment of ecosystem condition. This component is essential for understanding the functional capacity of ecosystems to deliver services such as climate regulation, water purification, and pollination.

Therefore the need for linked indicators that bridge Goal A (ecosystem integrity and biodiversity) with Goal B (sustainable use and ecosystem service delivery) of the GBF is urgent. NCA provides a unique opportunity to harmonize these goals through ecosystem accounting frameworks like SEEA EA, which enable consistent tracking of ecosystem assets and services over time and space.

Knowledge of the relationship between ecosystem condition and ES outcomes remains limited, and studies are often restricted to small spatial scales. Scaling and strengthening these connections—through integrated modeling, machine learning, scenario analysis, and spatially disaggregated data—will be essential for achieving multiple biodiversity policy outcomes, including the European Nature Restoration

Regulation aim of restoring at least 20% of land and sea areas by 2030, and the GBF's 2050 vision of living in harmony with nature.

This session aims to bring together researchers, policymakers and practitioners to explore challenges, methodological advances, opportunities and research needs to better establish and quantify, and integrate the components of natural capital accounting. We would like to explore key questions such as How can traditional ES supply modelling better integrate ecosystem condition into ES outcomes, and can this be done at scale? How can we better connect knowledge on ecosystem extent and condition to outcomes for ES and biodiversity, whilst maintaining the independence of the accounting components?

The session will use a mix of short talks (approx. 5 mins) and plenary discussions to identify operational, technical, political and scientific needs and opportunities to address key knowledge gaps and advance natural capital accounting. The session invites contributions from diverse disciplines and projects to foster dialogue across scales, systems and sectors.

1. Rendon, P., Erhard, M., Maes, J., & Burkhard, B. (2019). Analysis of trends in mapping and assessment of ecosystem condition in Europe. Ecosystems and People, 15(1), 156–172. https://doi.org/10.1080/26395916.2019.1609581

Goals and objectives of the session:

Showcase innovative approaches to assess ecosystem extent, condition, and service provision within an integrated framework across scales and systems. Short talks are invited, which:

- Conceptually frame and discuss the different terms and components of natural capital accounting, and how they apply to sustainable development across scales;
- Critically discuss challenges and opportunities in quantifying links between extent, condition and services;
- Identify methodological and conceptual challenges in capturing interactions between ecosystem condition and services;
- Introduce novel approaches (e.g. network-based approaches or machine learning) to model interlinked dynamics between ecosystems spatial extents, their condition and multiple ecosystem service outcomes.
- Bring together researchers and practitioners to co-identify research priorities for improving these links, fostering community building and networking.
- Strengthen the interface between scientific advances (such as integrated ecosystem assessments) and international policy frameworks, including the Kunming-Montreal Global Biodiversity Framework and European Restoration Regulation.

Planned output / Deliverables:

- A consolidated set of recommendations for future research directions on condition-service linkages.
- A synthesis report or session summary highlighting key insights, gaps, and opportunities to be shared with participants and made available to the ESP community.
- Enhanced collaboration among ongoing projects, initiatives, disciplines and geographic regions addressing ecosystem extent, condition, and services to build a collaborative network of researchers and practitioners working on conjunctive ecosystem modelling.

Session format:

We propose a session of short talks (up to 5 mins) to highlight key challenges, opportunities, showcase emerging research and technologies. These will form the basis of a guided plenary discussion to identify next steps. We estimate 1.5-2hrs for the session duration.

Voluntary contributions accepted:

Yes, I allow any abstract to be submitted to my session for review

Related to ESP Working Group:

TWG 17 – ES Accounting & Greening the economy