

## SESSION DESCRIPTION

### ID: T19b

Artificial Intelligence and Ecosystem Services – Advancements in AI in the field of ecosystem services for transformative change

Day: Monday

Time: 14:00 – 15:30 & 16:00 – 17:30

### Hosts:

	Name	Organisation	E-mail
<b>Host:</b>	Vince van 't Hoff Pedro Cabral  Felicia O. Akinyemi	Foundation for Sustainable Development Nanjing University of Information Science & Technology Karlstad University, Sweden	vince.vanthoff@fsd.nl cabral@nuist.edu.cn  felicia.akinyemi@kau.se
<b>Co-host(s):</b>	Mieke Siebers Bruna Almeida Guojie Wang Jan Haas Sara Alibakhshi Xi-Lillian Pang Ewa Orlikowska	Foundation for Sustainable Development University of the Azores (UAc) Karlstad University, Sweden University of Helsinki, Finland KTH Royal Institute of Technology Karlstad University, Sweden	mieke.siebers@fsd.nl bruna.campus.unl@gmail.com  jan.haas@kau.se xip@kth.se sara.alibakhshi@helsinki.fi ewa.Orlikowska@kau.se

### Abstract:

Artificial intelligence (AI) is quickly emerging as a powerful tool for rethinking the way we understand, monitor, and manage ecosystems and their services. From satellite image analysis to natural language processing, AI technologies offer innovative solutions for extracting valuable insights from complex data types and provide a way to effectively and efficiently gather and analyze vast amounts of data. In a world with increasing reliance on technological advancements to map, model, assess and monitor ecosystem service changes, harnessing the power of AI has the potential to transform the way we understand and approach ecosystem services (ES) and their functions (EF). This is not a goal in itself, but it should ultimately serve to account for the value of nature in an equitable way in decision making. Taking a one health perspective allows to balance environmental, social and economic needs with intrinsic value of nature.

This session aims to contribute to transformative change via highlighting and discussing advances in the field of ES related to AI. We aim to set the scene by highlighting the

transformative potential and key challenges of AI. We will discuss best practices and inspiring examples to spark imagination to use AI in the diverse field of ES. For example, how can learning algorithms such as machine learning, deep learning and transfer learning support the assessment of ES and EF? Given the diverse methods available, including using GeoAI to derive indicators from remote sensing images, data extraction to effectively gather, streamline and standardize relevant information from scientific literature (and contribute to the ESVD), how can AI be leveraged to enhance the assessment and modelling of the supply, demand and flow of ES and EF? How does AI contribute to meeting the growing demand for inclusion to cater to “peoples’ obligations to nature” and “nature’s contribution to people” in ES and EF assessment? What are the trade-offs and synergies among ES and EF in different scenarios?

Furthermore, the session will highlight the importance of collaborative efforts in guiding the rapid developments in AI and ES research. By fostering discussion, awareness of each other’s projects and interdisciplinary collaborations between ecologists, data scientists, policymakers, and other stakeholders, we can leverage collective expertise to address key challenges and discuss new opportunities in ES assessment and management.

We cordially invite you to contribute to our session with an abstract related to a broad range of perspectives regarding the transformative potential of AI for ES. Not limited to and including best practices and ethical, methodological, applicational considerations of AI in mapping and assessing ES. Communications to be presented at this session will be possibly considered for either a synthesis paper or a review paper showcasing knowledge gaps in AI use in ES in empirical or modelling contexts.

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

- **Explore Recent Advancements:** To showcase and discuss the latest advancements in AI technologies and methodologies relevant to ecosystem services research, including data extraction, analysis, and interpretation.
- **Promote Collaboration:** To foster interdisciplinary collaboration and knowledge exchange among researchers, practitioners, policymakers, and other stakeholders interested in leveraging AI for ecosystem services assessments and management.
- **Share Best Practices:** To identify and share best practices for integrating AI technologies into existing research methodologies and workflows.
- **Address Ethical Considerations:** To raise awareness and facilitate discussions around the ethical considerations, potential biases, and limitations associated with AI-driven approaches in ecosystem services research, and to explore strategies for mitigating risks and ensuring responsible use of AI technologies.

- **Inspire Innovation:** To inspire innovation and creativity in the application of AI technologies to address pressing environmental challenges and promote sustainable management of ecosystems and their services.
- **Identify Opportunities:** To identify opportunities for future research, collaboration, and capacity building in the intersection of AI and ecosystem services, with the aim of advancing scientific understanding, informing policy decisions, and enhancing conservation efforts.

**Planned output / Deliverables:**

Possibly a special issue/a paper based on discussions during the day.

**Session format:**

Standard session (presentations)

Discussion forum

**Voluntary contributions accepted:**

Open for abstracts to be submitted to the session for review.

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

Thematic Working Groups: TWG 5 – Modeling ES / TWG 3 – ES Indicators