ESP 11 World Conference

"From global to local ecosystem services: pathways to Nature-based Solutions inspired from Down Under"

23-27 June 2025 | Darwin, Australia

SESSION DESCRIPTION

ID: 05

Ecosystem Services and NbS – From Local Wisdom towards Global Sustainability through Artificial Intelligence and Machine Learning

Hosts:

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Abstract:

Artificial Intelligence (AI) is revolutionizing how we understand, monitor, and manage ecosystems, offering innovative pathways to integrate Indigenous and local community knowledge with advanced analytical methods. By bridging ecosystem services science on a local and global scale and cutting-edge technologies such as deep learning, GeoAI and Large Language Models (LLMs), this session explores how AI can enhance our understanding of ecosystem services, their underlying functions and Nature-based Solutions (NbS) to shape inclusive pathways towards a more sustainable Earth.

This session emphasizes the synergy between AI innovations and value systems across various spatial scales in designing equitable NbS. By incorporating diverse knowledge systems, AI can support the assessment of ecosystem service distribution, quality, supply, demand, flow and design of NbS while respecting local cultural and ecological nuances. The session aims at showcasing how AI applications within the fields of remote sensing, (big) geodata processing and natural language processing, enable better mapping, monitoring, and decision-making while addressing local and global challenges related to biodiversity conservation, climate adaptation, and achieving Sustainable Development Goals (SDGs).

Key topics include:

- Successful models of AI-powered NbS from local to global scales, emphasizing adaptability and scalability.
- Innovative methods to integrate AI into ecosystem assessments to promote nature-positive outcomes, harmonizing "people's obligations to nature" with "nature's contributions to people."
- Ethical considerations and strategies for ensuring AI tools amplify, rather than overshadow, Indigenous and local perspectives in decision-making processes.

- Best practices for linking ecosystem services science with policymakers, practitioners, and multi-sector stakeholders.

- A future outlook which highlights and discusses the role of AI in the field of ES, NbS and plural valuation from a local to a global scale.

By fostering interdisciplinary collaboration and leveraging the potential of AI, this session aims at sharing our experiences and results at any spatial scale, inspire actionable insights that connect research to practice and local insights to global goals. Attendees will explore opportunities to co-develop innovative frameworks, bridging technology and traditional knowledge for a sustainable, equitable, and resilient future.

We cordially invite you to contribute to our session with an abstract related to a broad range of perspectives regarding the potential of AI for Ecosystem Services and NbS. Not limited to and including best practices and ethical, methodological, applicational considerations of AI in mapping and assessing ES.

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 and NbS 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 and NbS 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 ethical considerations, potential biases, and limitations associated with AI-driven approaches in ecosystem services and NbS 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.

Post-conference inception of AI-related Thematic Working Group.

Session format:

Oral presentations, one half-day or shorter

Voluntary contributions accepted:

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

Related to ESP Working Group:

Other