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: O7

Adaptive solutions to enhance positive synergies between forest and water ecosystems

Hosts:

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Abstract:

Freshwater is vital for human wellbeing, and important for delivery of a wide range of ecosystem services, including drinking water, livelihoods, habitats, recreation opportunities and cultural significance. In forested catchments, the continuous interplay between aquatic and terrestrial environment is complex and specific. Watercourses have a profound impact on nutrient supply and erosion processes in the riparian zone, moreover, they play an important role in the dispersal of terrestrial and aquatic organisms, including invasive species. Riparian forests protect the watercourses from pollution, decrease erosion risks and support diverse structures important for biodiversity, such as trees with microhabitats, groundwater discharge areas and dead wood for terrestrial and aquatic organisms.

Aspects of the global change, such as climate warming, pollution, and biodiversity decline alter both forest and water ecosystems, as well as the complex relationships between the two. Warmer temperatures and changing precipitation patterns leading to more extreme draughts and flooding affects the dynamics of natural disturbances in the riparian forests. Changes in water level fluctuation and thus soil moisture due to prolonged flooding and flooding-drying conditions can additionally affect the magnitude of greenhouse gas fluxes in riparian zones. Severe windthrows, insect outbreaks and invasions of alien species substantially affect the natural dynamics of the riparian zones, affecting the capacity of the forests to ensure wide variety of ecosystem services. Also, with the altered disturbances, as well as presence of aggressive invasive species the protective functions of the riparian forest can be weakened, affecting waters. Tailored management solutions are essential to prevent and/or mitigate such negative outcomes.

Adaptive management and nature-based solutions (NbS) are increasingly recognized as effective strategies for addressing environmental challenges while providing multiple co-benefits. Recent research highlights the importance of integrating these approaches in forest and water ecosystem management to enhance resilience, biodiversity, and ecosystem services. For instance, NbS such as ecological forest management and wetland restoration have been shown to improve water quality, sequester carbon, and support biodiversity, thus

contributing to achieving sustainable development goals and climate resilience. Case studies from various regions demonstrate the practical benefits and scalability of these solutions.

By focusing on the interconnectedness of forest and water environments, the session aims to highlight the multifaceted benefits of sustainable management practices. Key areas of discussion will include:

- Innovative practices in forest management that enhance ecosystem services.
- Nature-based solutions specifically aimed at improving water quality and other ecosystem services in forested catchments.
- Case studies and examples of good practices.
- Policy frameworks and community engagement strategies that support these integrated approaches.

We welcome presentations mainly from temperate and boreal forests of the Northern hemisphere, including boreal and hemi-boreal regions, as well as from temperate forests of the Southern hemisphere showcasing planning approaches and good practice examples of adaptive management solutions in forested river catchments. While our focus is primarily on forest land, topics pertaining to different tree-dominated ecosystems (e.g., tree plantations in riparian zones established or managed to safeguard and increase ecosystem services) will also be considered.

Goals and objectives of the session:

This session will delve into the innovative integration of adaptive management strategies and nature-based solutions to enhance ecosystem services within forest and water ecosystems.

Aims of the session:

- To explore and share innovative forest management practices that contribute to ecosystem services.
- To discuss the implementation and benefits of nature-based solutions for water quality improvement in forested areas.
- To present successful case studies, providing practical insights and lessons learned.
- To identify general preconditions for successful NbS implementation in forest-water nexus.
- To identify effective policy frameworks and community engagement strategies that support the adoption of nature-based solutions.

Planned output / Deliverables:

Outcomes of the session:

- Enhanced understanding of the interconnectedness between forest and water ecosystems.
- Shared knowledge on implementing nature-based solutions to improve ecosystem services in these environments.
- Increased awareness of successful case studies and best practices from around the world.
- Networking opportunities for researchers, practitioners, and policymakers to collaborate on future projects.
- A session report summarizing the main presented findings and examples and including a set of defined preconditions for successful implementation of NbS.

- Depending on the topics of the submitted abstracts – a review paper on exploring and exploiting the forest-water synergies when planning and implementing NbS.

Session format:

The session will start with 5-7 min long flash talks and will be continued by a round-table discussion with questions from the audience. While flash talks are more challenging, this format will maximize the amount of information, at the same time providing the opportunity to exchange opinions on the presented topics and to collaboratively synthesize common conclusions. The length of the session depends on the number of submitted/accepted abstracts, and might vary from just one morning/afternoon session (~ 2 h, as per experience in the previous conferences) to both morning and afternoon session (~ 2 h each).

Voluntary contributions accepted:

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

Related to ESP Working Group:

other/ES in forest and water