

THEMED SESSION

Rethinking Wildfire Resilience: Integrating Forest, Spatial and Physical Dimensions Across the Wildland – Urban Interface and Critical Infrastructures

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DESCRIPTION



Wildfires are escalating in frequency and intensity under climate change, increasingly threatening communities, ecosystems, and critical infrastructures within the Wildland–Urban Interface (WUI). Yet, current approaches remain fragmented, typically addressing forest, spatial, and physical resilience in isolation. This Special Session will explore innovative frameworks and solutions that bridge these silos by advancing the **three core resilience dimensions** and connecting them across the entire wildfire cycle—**before, during, and after fire events**.

Contributions are invited on:

- **Forest resilience** – ecological management, fuels reduction, and ecosystem recovery strategies.
- **Spatial resilience** – wildfire simulation modelling, geospatial and optimisation methods for firefighting resource deployment, evacuation planning, and territorial adaptation.
- **Physical resilience** – structural vulnerability, fragility models for buildings and infrastructures, and integration of resilience into design codes and risk-based insurance.
- **Technological enablers** – AI, satellite constellations, UAVs, IoT sensor networks, crowdsourcing, and immersive AR/VR tools that strengthen detection, preparedness, situational awareness, and community engagement.

The session aims to highlight the Interdependent Resilience Nexus (IRN), a circular and technology-driven framework that operationalises resilience across all phases of wildfire events. By integrating fragility models, simulation outputs, and adaptive planning, it will showcase systemic, cross-sectoral solutions that reduce losses, support sustainable development, and safeguard critical infrastructures. Bringing together researchers, infrastructure operators, policymakers, risk analysts, and technology innovators, the session will serve as a platform to exchange methodologies, identify challenges, and outline pathways for advancing resilience through the IRN.