**Session Proposal**

# Session Title

Occurrence, mechanisms, and behavior of soil water repellency

# Session Organizers

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# Session Description

The session will introduce a new role of soil water repellency (SWR) in ecosystem stability and environmental sustainability. SWR is a widespread yet critical phenomenon influencing hydrological processes, agricultural sustainability, and ecosystem functioning. This session will showcase the occurrence patterns across diverse ecosystems (forests, agricultural lands, grasslands, post-fire landscapes). We invite contributions from laboratory experiments, field observation, or modelling studies that delve into the persistence of SWR while highlighting emerging evidence of its physical, chemical, and biological underpinnings. The implication of SWR on soil-plant feedback, carbon-water-nutrient cycling, and soil amendment strategies from nanoscale to the whole ecosystem level were welcome to share in the session. SWR challenges traditional soil-water relationship paradigms, with growing global significance under climate change scenarios and intensive human activity, creating a pressing need for cross-disciplinary collaboration. The session will bridge soil science, hydrology, ecology, environmental science and agronomy, clarify the new role of SWR in carbon sequestration dynamics, adaptive strategies for water-repellent soil in arid and semi-arid regions. The session will foster dialogue and collaboration between researchers and practitioners, advancing both fundamental understanding and practical solutions in addressing this globally significant soil property.

# Format

Oral presentations, Poster presentations

# Proposed Speakers

**Coen Ritsema, Wageningen University, The Netherlands.** He is one of the leading experts in the field of soil-water repellency. With approximately 30 years of experience, he has conducted both fundamental and applied research in soil and water sciences. His publication record includes over 80 articles that have garnered more than 26,000 citations, resulting in a H-index of 83.

**Stefan Doerr, Swansea University, UK.** He is a pioneering researcher in wildfire-environment interactions, particularly regarding soil-water repellency and post-fire ecosystem recovery. His work significantly advances understanding of fire impacts on soil carbon dynamics, erosion processes, and hydrological systems.

Jörg Bachmann, Leibniz University Hannover, Germany. He advances soil science by pioneering modeling approaches, connecting soil properties with climate dynamics and ecosystem functioning, while promoting sustainable environmental management.

**Stefan Dekker, Utrecht University/ Netherlands Institute of Ecology (NIOO-KNAW) (starting from June), The Netherlands**. His interdisciplinary research is bridging soil hydrology and ecology with soil functions, advancing soil science and sustainable ecosystems. His work integrates complex soil-water interactions and emphasizes societally impactful ecological management strategies.

**Karin Müller, The New Zealand Institute for Plant and Food Research Limited, New Zealand.** She is a senior scientist expanding agro-environmental insights by innovatively analyzing agriculture’s multifaceted impact on water-soil dynamics, carbon cycling, and nutrient processes.

**Rony Wallach, Hebrew University of Jerusalem, Israel**. He is a well-known expert working on soil-water dynamics and developing smart irrigation systems. With more than 30 years' expertise, His groundbreaking studies on water-repellent soils and effluent irrigation impacts revolutionized agricultural water management.

**Peter Šurda, Institute of Hydrology, Bratislava, Slovak Republic**. He has contributed to significantly advanced research on soil water repellency. His contributions underscore his pivotal role in understanding and managing soil water repellency in various environmental contexts. He is the present Director of the Institute of Hydrology at the Slovak Academy of Sciences

**Radka Kodešová, Department of Soil Science and Soil Protection, Czech University of Life Sciences, Prague, Czech Republic**. Her research interests span various aspects of soil science, with a particular focus on soil water repellency, soil contamination, and the interactions between soil, water, and pollutants. She has also contributed to studies on the behavior of micropollutants in soil and has collaborated on projects addressing the effects of soil organic matter and terrain properties on soil structure.

**Massimo Iovino, University of Palermo, Italy.** He has collaborated for various research on assessing soil water repellency induced by plant species across different geographic regions, providing insights into how different plant species influence soil hydrophobicity, including the impact of reforestation. His research helps particularly in understanding and managing soil water repellency in Mediterranean environments.