**Session Proposal**

- **Session Title**:

Advances in Remote Sensing for Soil Property Mapping

- **Session Description**:

Accurate and up-to-date maps of soil properties play a crucial role in agricultural land management, soil production potential, and land development planning. Over recent decades, digital soil mapping has undergone remarkable advancements, revolutionizing the estimation of soil properties through the integration of sophisticated remote sensing technologies. These developments enable to construct predictive models for assessing key soil attributes, such as organic matter, fertility, texture, moisture, salinity, water content, and heavy metals,across diverse spatial scales, from fields to global scales. This session aims to explore the latest scientific breakthroughs and state-of-the-art methodologies in soil property mapping, emphasizing their critical role in addressing contemporary challenges in soil health, agricultural sustainability, and environmental stewardship.

The session may include (but are not limited to) the following:

(1) Cutting-edge remote and proximal sensing techniques for predicting soil properties, such as organic matter, fertility, texture, moisture, salinity, and heavy metals, enhancing precision and scalability;

(2) Optimal soil sampling strategies for soil mapping and monitoring based on remote and proximal sensing techniques;

(3) Advanced approaches for spatially monitoring soil properties within soil profiles, providing deeper insights into vertical variability and dynamics;

(4) Innovative strategies for integrating multi-source or multi-platform remote sensing data to improve the accuracy and resolution of soil property maps;

(5) Investigations into how soil property variability influences crop planting structures, agricultural management practices, and overall productivity, with implications for food security;

(6) Practical case studies demonstrating the application of soil property mapping in precision agriculture, cultivated land quality assessment, and land reclamation efforts, showcasing real-world impact.

By highlighting these advancements, the session aims to foster interdisciplinary collaboration and knowledge exchange, driving the development of robust tools and frameworks for sustainable agriculture and land management.

- **Session Organizers:**

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- **Target Audience**:

The intended audience for this session includes researchers, academics, policymakers, land managers, and industry professionals involved in soil science, agriculture, and environmental sustainability. This session will interest them by showcasing cutting-edge advancements in digital soil mapping based on remote and proximal sensing, innovative methodologies, and practical applications for predicting soil properties such as organic matter, fertility, texture, moisture, salinity, and heavy metals. It offers a platform for knowledge exchange, collaboration, and exploring solutions to global soil-related challenges, making it valuable for optimizing land management, supporting sustainable practices, and fostering interdisciplinary innovation.

- **Format**:

The session will primarily feature oral presentations, allowing researchers to present their latest findings, methodologies, and case studies in a structured 15-minute format, followed by 5-minute Q&A segments to encourage audience interaction and critical feedback. These presentations will showcase cutting-edge advancements in remote sensing applications for soil property mapping, ensuring a broad representation of innovative research.

- **Relevance**:

This session aligns closely with the overarching theme of the congress, which emphasizes advancing soil science to promote sustainability and food security. By focusing on the critical challenge of accurately mapping soil properties through innovative remote sensing techniques, the session addresses pressing issues related to soil health, degradation, and land management. It highlights the integration of cutting-edge technologies, such as remote sensing, machine learning, and geostatistical modeling, with practical applications to enhance precision agriculture, land reclamation efforts, and evidence-based policy formulation. Furthermore, the session fosters interdisciplinary collaboration and showcases data-driven solutions, contributing to the congress’s mission of driving progress in soil science.