SESSION 59- Environmental Monitoring and Seismology Across Scales: From Storage Sites to Storms

Conveners
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Session Description

Environmental seismology has rapidly evolved into a vibrant and interdisciplinary field, transforming how we monitor and understand Earth-system processes. From tracking CO_2 storage integrity and geothermal activity to observing hydrological, glacial, and atmospheric phenomena, seismological and related geophysical data provide powerful tools for environmental monitoring across scales.

This session highlights the latest advances, challenges, and opportunities in environmental and meteo-seismology, with a special focus on innovative uses of existing infrastructure and cross-disciplinary applications. We invite contributions showcasing how traditional and emerging seismic technologies reveal dynamic processes in the subsurface, at the surface, and within the atmosphere.

Topics of interest include:

- Seismic and geophysical monitoring of CO_2 storage sites, geothermal systems, subsurface deformation, and groundwater dynamics.
- Re-purposing existing stations for environmental and meteo-seismological applications.
- Seismological and infrasound studies of storms, precipitation, avalanches, landslides, glaciers, and other environmental processes.
- Developments in machine learning, signal detection, and array analysis for weak or non-impulsive sources.
- Integration of distributed acoustic sensing (DAS), dense nodal arrays, and traditional sensors for advanced array-based and multi-sensor processing.
- Interdisciplinary approaches combining seismology, meteorology, hydrology, glaciology, and environmental science.

We particularly welcome contributions that demonstrate interdisciplinary collaboration, linking seismology with meteorology, geodesy, hydrology, oceanography, glaciology, and environmental engineering. By fostering exchange between communities, the session aims to accelerate the development of integrated Earth-system monitoring frameworks that can inform both scientific understanding and societal applications.

Join us to explore how seismic records — from ocean-bottom sensors to continental arrays and fibre-optic networks — are becoming a key asset for observing our changing planet.