SESSION 26- Environmental Seismology

Conveners

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Session Description

Environmental seismology leverages seismic and seismoacoustic signals to explore processes across the cryosphere, hydrosphere, atmosphere, and surface and subsurface processes in natural and urban environments.

Seismic and seismoacoustic monitoring have opened new possibilities for studying the dynamics of glaciers, ice sheets, permafrost, snowpack, and subglacial environments within the cryosphere. By adapting techniques such as source modeling, interferometry, and ambient noise analysis, researchers can investigate otherwise inaccessible processes and structures. In the hydrosphere and atmosphere, seismoacoustic signals from oceans, rivers, lakes, and the air reveal the behavior of waves, currents, ecosystem activity, and support the tracking of long-term climate trends. The integration of these observations across Earth's spheres advances our understanding of interconnected environmental processes.

In urban settings and the critical zone, seismology enables continuous assessment of subsurface structures, infrastructure integrity, and urban-specific hazards with tools like distributed fiber sensing and anthropogenic noise analysis. Seismic imaging supports sustainable management of groundwater, geothermal activity, and other key resources, while interdisciplinary data integration enhances environmental monitoring. Environmental seismology also plays a central role in natural hazard studies, including landslides, debris flows, avalanches, and volcanic phenomena, with advances in multi-sensor networks and data analysis improving hazard detection and mitigation.

This joint ECS-SSA session invites contributions that exploit seismic and seismoacoustic methods to investigate environmental processes, hazards, and subsurface dynamics

across diverse Earth systems. Emphasis is placed on methodological innovation, integration with complementary observations, interdisciplinary exploration, and applications that enhance understanding of natural processes, environmental change, and societal resilience.