Greenet

The network of Horizon Europe
Cluster 5 National Contact Point.





SEIS-ALERT

AI-enhanced detection and rapid alerting of climate-sensitive geohazards using existing seismic networks

GREENET Brokerage Event · 19 November 2026 · Brussels

Project idea · Target topic: HORIZON-CL5-2027-01-D1-07 (RIA)

Advancing understanding, modelling and prediction of extreme events in a changing climate

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Partners wanted: EU coordinator; seismic networks, AI and early-warning experts

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Geohazards are outpacing monitoring

Rising hazard

Climate change alters precipitation and intensifies extremes, driving more landslides, debris flows and rock avalanches.

Growing exposure

Expanding settlements and infrastructure in mountain areas increase exposure and can aggravate geohazards, raising risk for more communities.

Monitoring gap

Thousands of slopes, valleys and catchments have no dedicated monitoring and instrumenting them all is unaffordable.

The untapped opportunity

National seismic networks already record “exotic” seismic events: landslides, debris flows, rockfalls and avalanches that earthquake processing does not classify.

33 lives lost in the 2023 Shovi debris flow, Georgia, in a remote valley

An intelligent layer on existing seismic networks

01

Continuous waveforms

Real-time data from national and regional stations

02

AI detection

ML / deep learning separates mass movements from quakes and noise

03

Source location

Algorithms adapted to non-tectonic signals

04

Verification

Weather, geology, satellite and terrain data

05

Rapid notification

To monitoring centres and emergency authorities

Each preliminary alert reports

- Estimated location
- Probable event type
- Detection confidence
- Supporting evidence for rapid verification

Runs alongside earthquake monitoring

No interference with existing functions, little new infrastructure, and transferable to any network.

Scientific basis: environmental seismology research (USGS, European institutions) shows mass movements produce identifiable seismic signals.

What European partners gain

Tools you can take home

AI models and detection-capability maps designed to transfer to any country's network

More from your own network

Add geohazard detection to your national or regional network at low cost, without affecting earthquake monitoring

A natural laboratory

Steep mountains, active tectonics and frequent extreme weather produce the events needed to train and test methods

Data from day one

Continuous waveforms from Georgia's national seismic network, plus LiDAR terrain models

Shared reference dataset

Documented non-tectonic events with waveform, weather and remote-sensing data

A full Horizon Europe partner

Georgia is an associated country, so we join on the same terms as EU partners

Validation: live pilots on seismic networks

Real-time testing

Live pilots on seismic networks in Georgia and selected European countries

Different geological, climatic and monitoring conditions test transferability

Live results build the evidence for operational uptake by monitoring centres

We measure

- Detection performance
- Localisation accuracy
- False-alarm rate
- Processing time
- Operational reliability

What SEIS-ALERT will deliver

AI software framework

Continuous, automated analysis of seismic waveform data

Validated algorithms

Detection, classification and localisation with confidence and uncertainty

Rapid notification system

Preliminary alerts to monitoring centres and authorised institutions

Reference dataset

Non-tectonic events with waveform, geological, weather and remote-sensing data

Detection-capability maps

Where networks can see hazards, and where new instruments are needed

Pilot demonstrations

Accuracy, reliability and transferability tested in Georgia and the EU

Impact

- Wider geohazard coverage at low added cost
- Better situational awareness for emergency response
- More value from existing seismic infrastructure
- Stronger climate adaptation and disaster risk reduction across Europe and beyond

Who we are: IES–NSMC, Ilia State University

Organisation
Ilia State University, a public university and research institution

Department
Institute of Earth Sciences & National Seismic Monitoring Centre

Country
Tbilisi, Georgia (Horizon Europe associated country)

Role in SEIS-ALERT
Lead partner of the Georgian pilot

Why Georgia
Mountain terrain, active tectonics, frequent extreme weather and an operating seismic network

What we contribute

- Georgia's seismic monitoring network and continuous waveform data
- Seismology, detection and localisation, waveform processing, scientific computing, AI modelling
- Geology, active tectonics, geomorphology, GIS and natural hazard assessment
- LiDAR-equipped drone for high-resolution 3-D terrain models and field validation
- Retrospective studies of Georgian disasters, subject to data availability

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Join us in building the consortium

EU-based coordinator
University or research institution to lead the consortium

Seismic networks & geological surveys
Data and test beds in different geological and climatic settings

Environmental seismology & AI/ML
Mass-movement signals, real-time processing, automated localisation

Remote sensing & early warning
Satellite verification and operational early-warning systems

Civil protection & authorities
Notification procedures and uptake in DRR and adaptation strategies

Contact

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SECOND PROJECT IDEA · HORIZON-CL5-2027-01-D1-10
From the Caspian to the Black Sea: Climate Change and Geobiological Responses along the Silk Road Middle Corridor – Prediction and Adaptation