

Earthquake Resilient Schools (EReS) - Project Snapshot

Overview

The [EReS project](#) focuses on harmonizing seismic hazard and risk assessments in the Greece-Türkiye Cross Border Area (CBA), with a special emphasis on the safety of school buildings. It combines advanced methodologies, collaborative frameworks, monitoring systems and training activities to improve earthquake preparedness and resilience in a high-seismicity region.

Main Outputs

1. Seismic Hazard Harmonization (Deliverables [D.2.1](#) & [D.2.2](#))

- Developed a **harmonized framework** for seismic hazard assessment using a **logic tree approach** to address uncertainties.
- Selected four **pilot sites**: Alexandroupoli, Çanakkale, İzmir, and Vathy.
- Created **Probabilistic Seismic Hazard Assessment (PSHA)** maps for Peak Ground Acceleration (PGA), Peak Ground Velocity (PGV), and spectral accelerations for different return periods.
- Produced **Deterministic Seismic Hazard Assessment (DSHA)** scenarios for localized hazard estimation.

2. Seismic Risk Assessment for Schools (Deliverables [D.3.1](#) & [D.3.2](#))

- Compiled a **common database** of school building characteristics, structural typologies, and vulnerabilities.
- Conducted **fragility and vulnerability analyses** using finite element models.
- Produced **risk maps** showing damage probability for different earthquake scenarios.
- Compared modeled damage with **real-world impact** from the M7.0 Samos earthquake (2020).

3. Instrumentation & Monitoring (Deliverable [D.4.1](#))

- Installed **low-cost accelerometers** (SeismoBug© v3.0 in Greece and SH-HPAS sensors in Türkiye) in selected schools.
 - Developed **real-time monitoring capabilities** for structural health assessment.
 - Established seismic damage indicators to enhance fragility models and inform rapid damage assessment.
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Awareness-Raising & Capacity Building (Deliverables [D5.2](#) & [D5.3](#))

- **Target groups**: emergency managers, teachers & students, provincial authorities, public institutions, media, and private sector.
- **School-based training**:

- Disaster awareness sessions for Civil Protection personnel.
 - Disaster awareness sessions for teachers and students in pilot schools.
 - Introduction to “school seismology” and use of installed monitoring systems.
 - **Public outreach:**
 - Official visits to provincial authorities.
 - Social media campaigns and media engagement.
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Promotional & Educational Materials ([Deliverable D5.1](#))

- **Brochures and posters** distributed during workshops and school visits.
 - **“School Seismology” guidebook** (in Turkish) for teachers and local authorities.
 - **Infographics & GIS maps** visualizing school vulnerability and hazard levels.
 - **Workshop presentations** for stakeholders in Greece and Türkiye.
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Articles & Scientific Contributions

- Scientific presentations made:
 - Three presentations at the European Geophysical Union Conference, held in Vienna, Austria, (28-30 April, 2025)
 - Two presentations at the Turkish National Conference in Ankara (February and April 2025).
 - Four presentations at the Hellenic Conference of Earthquake Engineering and Engineering Seismology (ETAM) to be held in Athens (30 Oct. - 1 Nov. 2025)
 - One publication in a scientific Journal (Bulletin of the Seismological Society of America), accepted for publication in 2025.
 - Additional articles and abstracts will be submitted for national conferences; planned dissemination in peer-reviewed publications.
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Workshops & Events

- **Cross-border workshops** in [Alexandroupoli](#), and [Çanakkale](#).
 - Stakeholder engagement sessions involving:
 - Ministries, AFAD, education directorates, universities, and private sector.
 - Pilot school administrators and selected students.
 - Site visits to pilot schools to observe installed monitoring equipment and discuss seismic safety measures.
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Conclusion

The EReS project delivers a comprehensive package of **technical outputs, training, and outreach tools** that together:

- Improve the **accuracy** of seismic hazard and risk assessments.
 - Strengthen **school safety** through targeted monitoring, vulnerability reduction and enhanced response capacity of both authorities and school communities.
 - Foster **cross-border cooperation** for earthquake preparedness.
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Key Results

- **Shared Science:** Developed a unified method to assess earthquake hazards across the Greece-Türkiye border, with detailed maps for four high-risk pilot areas.
- **School Safety Database:** Documented school buildings' design, materials, and vulnerabilities to guide retrofitting and resource planning.
- **Advanced Risk Models:** Used real earthquake data to estimate potential damage and improve emergency planning tools.
- **Real-Time Monitoring:** Installed earthquake motion sensors (accelerometers) in schools, enabling rapid building safety checks after tremors.
- **Community Preparedness:** Delivered training, workshops, and awareness campaigns reaching students, teachers, and Civil Protection authorities.

Impact

- Authorities now share data and tools for coordinated earthquake preparedness.
- Real-time monitoring and harmonized risk assessment support faster, more efficient emergency response.
- Methods can be scaled to other public buildings and regions, strengthening overall community resilience.

Why It Matters

EReS is more than a research project - it is a cross-border partnership dedicated to making communities stronger. By sharing knowledge, technology, and training, Greece and Türkiye are working together to protect one of the most important and vulnerable groups in society: the school community. In essence, the EReS Project is a concrete step toward safer schools, deeper cross-border cooperation, and more resilient communities in one of the world's most earthquake-prone regions.