SAR4Heritage

InSAR-Based Ground Deformation Monitoring for Climate Resilience/Cultural Heritage Protection

Ancient Megalopolis archaeological site (Tripadvisor, 2026).

High-precision ground motion monitoring

InSAR detects Earth surface movements at millimeter–centimeter scales with high spatial resolution, enabling reliable measurement and long-term tracking of deformation.

Tracks key geophysical hazards

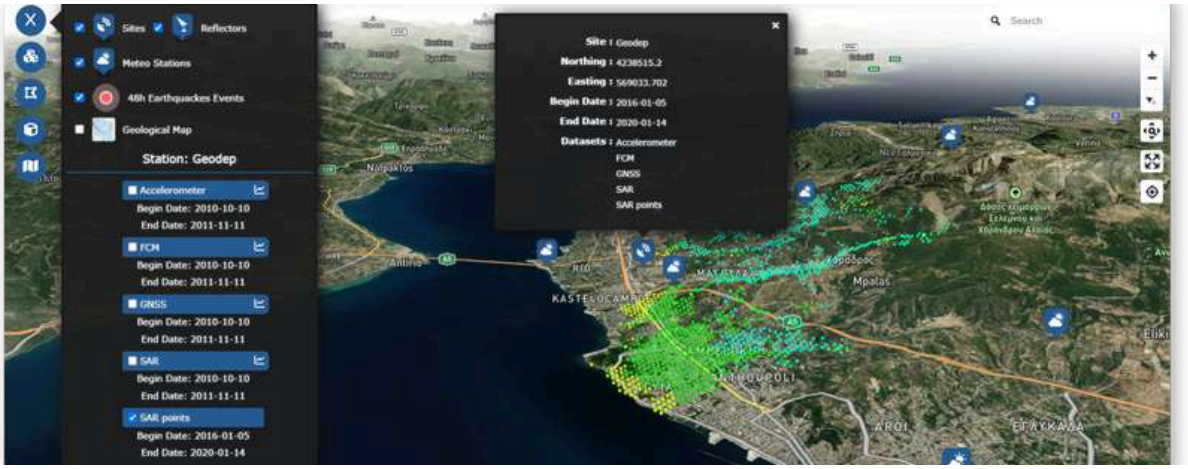
Supports detection, measurement, and monitoring of ground changes linked to:

- Earthquakes (co-, inter-, and post-seismic deformation)
- Volcanic activity (uplift/subsidence related to eruptions)
- Landslides (slope instability and progressive motion)

Enhanced insights through integration

Combining InSAR + GNSS strengthens monitoring by:

- Filling gaps in sparse, point-based geodetic networks
- Capturing localized deformation anomalies that may be missed by traditional stations



Criterion	Optical change-detection	GNSS-only monitoring	SAR4Heritage
All-weather, day/night capability	–	✓	✓
Broad-area, repeatable monitoring	◐	–	✓
Global coverage for scalable services	◐	–	✓
Designed for multi-source data fusion	◐	◐	✓
Ground and structural displacement monitoring	◐	✓	✓
Coherence/Velocitymap outputs	–	–	✓
Climate Change impact assessment	◐	◐	✓
End-to-end interferometric EO processing chain	–	–	✓

✓ = full support | ◐ = partial support | – = not supported

Panagia Mesosporitissa Church (Hellenic Ministry of Culture, 2024)