The Greek Supersite: An initiative from the most tectonically active part of Europe

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The GEO GSNL Initiative

A voluntary international partnership aiming to improve, through an Open Science approach, geophysical scientific research on seismic/volcanic hazard over specific interest areas called Supersites, supporting Disaster Risk Reduction activities.
Greek Supersite Team

Thirteen Greek collaborators in the Core Team
- Earthquake Planning and Protection Organisation (Supersite Coordinator)
- Eight Earth Observation Laboratories from Universities
- Four Earth Observation Laboratories from Research Centres

Seventeen International Collaborators in the Core Team

Twenty four International Organisations provided support letters
Region of Interest
Motivation

Three sub areas of high tectonic interest

- Ionian Islands
- Corinth Rift
- Evoikos Rift

High societal impact

- More than 50% of the population
- Millions of visitors per year
- Cultural Heritage
Ionian islands

- Highest observed seismicity in Europe
- Highest recorded ground acceleration in Greece (0.77g) at epicentral distance of 7km from a M6.0 earthquake on February 3, 2014

(Hatzidimitriou et al., 1994; Papazachos, 1999; Theodoulidis et al., 2016; Reilinger et al., 2010; Lagios et al., 2007, 2012; Ganas et al., 2013; Lagios et al., 2012)
Corinth Rift

- Corinth Rift, is an ideal natural laboratory to investigate rift deformation mechanisms.
- Both 5-10-yr GPS and 100-yr triangulation GPS velocity estimates suggest N-S extension at <5mm/yr in the east and >15mm/yr in the west.

(Leeder et al., 2008)
Evoikos Rift

Active faults

- a strongly thinned continental crust below the central section of the northern part with thicknesses of only 19-20km
- a local uplift rate exceeding 1mm/year

(Papanikolaou & Papanikolaou (2007); Papanikolaou et al. (1989); Ghisetti et al., 2016).

Recent Seismicity

(Makris et al., 2001; Cundy et al., 2010).
Research Objectives

- Long term monitoring of the area for mapping the crustal deformation and stress-strain regime, including time-varying patterns in an area that holds the highest seismicity in Europe.

- Perform updated seismicity relocations for the areas of interest, using the introduced calibrated crustal/upper models.

- Exploitation of the available datasets (existing and new) to obtain reliable empirical estimates of source, path and site effects for seismic motions in the Supersite area.

- Efficient fusion of the acquired earth and space observations in order to better monitor and understand the hazard sources.

- Exploitation of ground and satellite information to assess the risk in the Supersite area and achieve Disaster Risk Reduction and Quick Resilience.
In situ data

- Broadband and short-period seismic stations, accelerometers, campaign and continuous GPS, as well as digital elevation models.

- All data will be available succeeding the “Frascati declaration” following the recommendation “to stimulate an international effort to monitor and study selected reference sites by establishing open access to relevant datasets according to GEO principles to foster the collaboration between all various partners and end-users”. 3rd International Geohazards workshop of the Group of Earth Observation (GEO), held in November 2007 in Frascati, Italy.

- Provide appropriate infrastructure to e-registration for data availability.
Earth Observation data

- All kind of available **imagery data** (optical, multispectral, Radar, including airborne and UAV) will be evaluated and proceed with state of the art interferometry and other RS methodologies

- **Methodologies of fusion** and **change detection** will be applied

- **Copernicus Contributing Missions** with multispectral imagery like Rapid Eye, future Venus etc can also be utilized on specific areas to provide better scale mapping

- **Pleiades and SPOT 5** data to be available to the Supersite initiative through CNES

- All companies involved in the Greek Supersite Cluster will utilize EO data provided by the **CEOS agencies** only for scientific research. All private companies will be informed for that and respect this obligation through an NDA (Non-Disclosure Agreement).
Activities

- Data Infrastructure
- Greek Supersite WWW
- Open Access to Archive Data (Friendly Interface)
- Open Access to Real Time Data (Friendly Interface e.g. Seedlink Server)
- Open Access to Processed Data (Friendly Interface)
- Scientific Activities
- Training to Civil Protection
- Info-day of the Greek SS
- Public Activities
- Greek Supersite WWW (Secretariat Forms, FAQ, Questionnaires)
- Science close to Public
- e-newsletter
- Report to GEO GSNL
Our commitments

- All teams following the Memorandum of Understanding (MoU) will provide the data available for the area of the Greek Supersite following OGC, INSPIRE and other European initiatives.
- Through collaboration all teams combining the in situ data with satellite data shall provide synthetic consensus reports. Those shall be addressed to the GEO GSNL and the local emergency management agencies.
- The team of the Greek Supersite is open to collaboration with other supersites and other international initiatives to support the GSNL plan.
- The MoU undersigned from 13 organisations along with the detailed description of in Situ and EO data provide evidence of a full open data policy.
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