

EnCeladus hellen<u>ic Supersite</u> (Evolkos, Corinth rift and Ionian Sea)

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The GEO GSNL Initiative

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







Fifteen Greek collaborators in the Core Team

- * Earthquake Planning and Protection Organisation (Supersite Coordinator)
- Second Second
- Four Earth Observation Laboratories from Research Centres
- Two SMEs

Seventeen International Collaborators in the Core Team





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









- 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.
- South Sou







Evoikos Rift



Active faults



Recent Seismicity



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

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- 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





- * Long term monitoring of the area for <u>mapping the crustal deformation</u> and <u>stress</u>-<u>strain regime</u>, including time-varying patterns.
- * Perform <u>updated seismicity relocations</u> 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.
- * 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 and achieve <u>Disaster Risk Reduction and Quick Resilience</u>.





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 <u>establishing open access</u> to relevant datasets according to GEO principles to foster the collaboration between all various partners and end-users".
- ***** Provide appropriate infrastructure to <u>e-registration</u> for data availability.





Earth Observation data



- All kind of available <u>imagery data</u> (optical, multispectral, Radar, including airborne and UAV) will be evaluated and proceed with state of the art interferometry and other RS methodologies.
- Methodologies of <u>fusion</u> and <u>change detection</u> will be applied to imagery data.
- <u>Copernicus</u> Contributing Missions with multispectral imagery like Rapid Eye, and future Venus, will be utilized on specific areas to provide better scale mapping.
- All <u>SMEs</u> involved in the Greek Supersite Cluster will utilize EO data provided by the <u>CEOS agencies</u> only for scientific research. All private companies are informed for that and respect this obligation through an NDA (Non-Disclosure Agreement).





Activities



- Open Access to Data
- Training to Civil Protection
- Outreach Activities
 - ✤ GEO Plenary, St. Petersburg, 7th November 2016
 - ✤ AGU GEO GSNL Splitter meeting, December 2016
 - Info-day of the Greek Supersite (20th of February 2017)
 - ✤ EGU, Vienna, 27th April 2017
- Science close to Public
- e-newsletter
- Report to GEO GSNL







- All teams following the signed <u>Memorandum of Understanding (MoU)</u> will <u>provide data</u> available for the area of the Greek Supersite following OGC, INSPIRE and other European initiatives standards.
- * Reports that <u>combine the in situ data with satellite data</u> will be available.
- * The team of the Greek Supersite is open to <u>collaboration with other</u> <u>supersites and initiatives</u> to support the GSNL plan.
- * The MoU undersigned from 15 organisations along with the detailed description of in Situ and EO data provide evidence of a <u>full open data policy</u>.





Current status



- * PLEIADES (CNES) Satellite imagery is available to Greek Supersite team for 8 AOI.
- ***** Archive imagery from SPOT5 have been requested.
- **COSMOSkymed (ASI) AOI have been identified.**
- * Radarsat-2 (CSA) and TeraSAR-X (DLR) imagery soon to be requested.
- ***** First in situ dataset to be available on May 2017.
- Friendly interface for requesting GPS archive data to be available by summer 2017.





Funding:

- * One H2020 Proposal has been submitted and awaiting evaluation.
- One National funding proposal has been submitted and is funded.

Collaborations:

- * EPOS (https://www.epos-ip.org/)
- seohazards-tep (<u>https://geohazards-tep.eo.esa.int</u>)
- EVER-EST (<u>http://ever-est.eu/</u>)
- Copernicus (http://www.copernicus.eu/)





Thank you











National and Kapodistrian UNIVERSITY OF ATHENS







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HAROKOPIO UNIVERSITY





