



GROUP ON  
EARTH OBSERVATIONS

Geohazard Supersites  
& Natural Laboratories

# Status of the GEO-GSNL initiative

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Chair of the Supersites Advisory Committee

CEOS WG Disasters meeting #10, Naples, September 2018

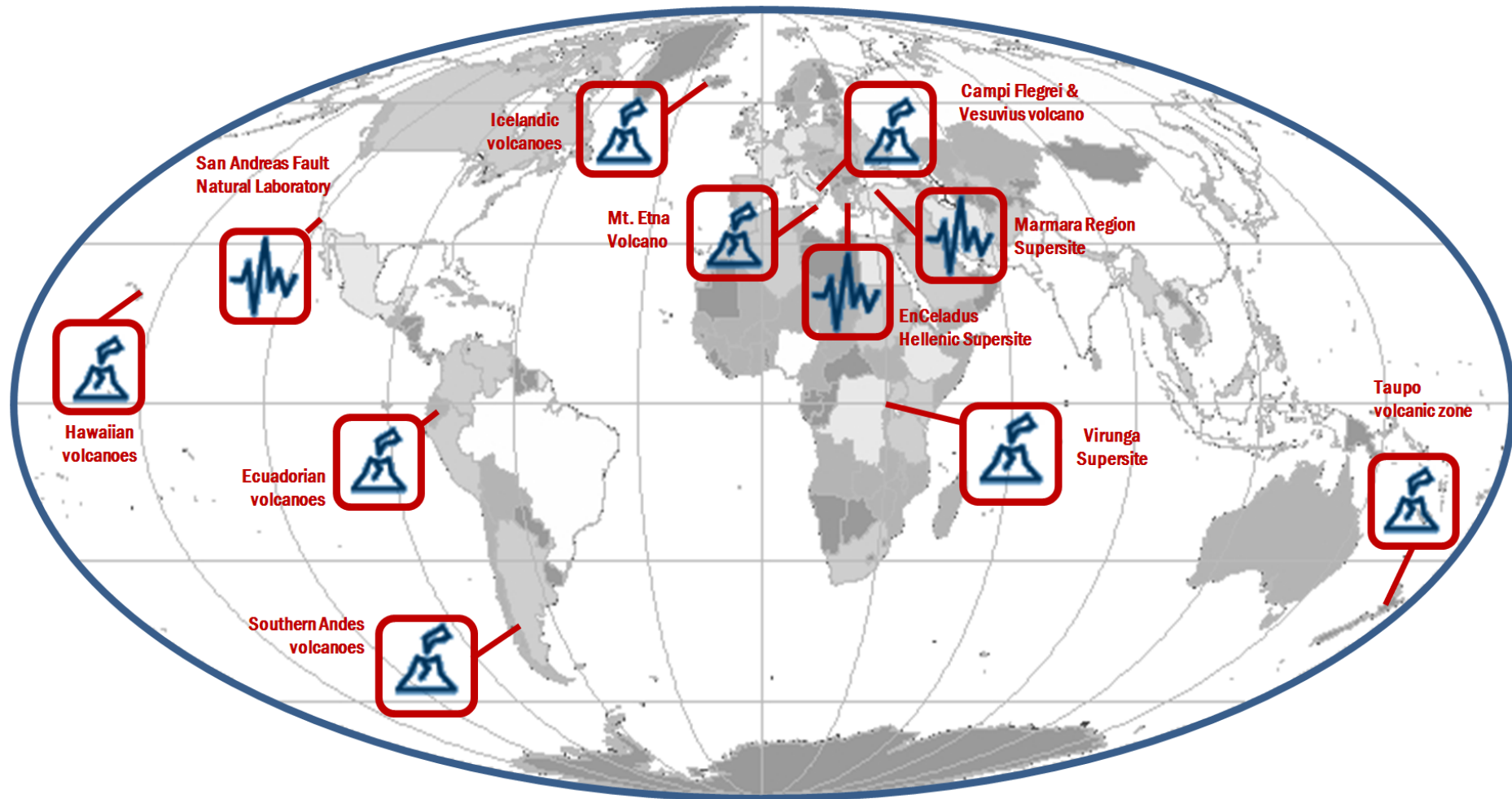


## GSNL session content

- Update on the initiative and report on general and open issues - S. Salvi
- Report on activities at the Iceland Supersite – F. Sigmundsson
- Report on activities at the Etna Supersite – G. Puglisi
- Report on activities at the Virunga Supersite – C. Balagizi



# The Supersite network in 2018





## Permanent Supersites

	Supersite	Status	Next Biennial report
1	Hawaiian volcanoes	6th year of activity	25-Oct-18 (3rd)
2	Icelandic volcanoes	To be renewed at SIT 33 (?)	5-Nov-19 (3rd)
3	Etna volcano	To be renewed at Plenary 32	9-Apr-20 (3rd)
4	Campi Flegrei/Vesuvius volcano	To be renewed at Plenary 32	9-Apr-20 (3rd)
5	Western North Anatolian Fault	To be renewed at Plenary 32	9-Apr-20 (3rd)
6	Taupo Volcano	Renewed at Plenary 31	29-Oct-18 (2nd)
7	Ecuador volcanoes	Renewed at Plenary 31	29-Oct-18 (2nd)
8	Corinth Gulf/Ionian Islands	2nd year of activity	8-Nov-18 (1st)
9	San Andreas Fault NL	2nd year of activity	27-Apr-19 (1st)
10	Southern Andes volcanoes	1st year of activity	19-Oct-19 (1st)
11	Virunga volcanoes	1st year of activity	19-Oct-19 (1st)



## Event Supersites

	<b>Supersite</b>	<b>Supporting agencies</b>	<b>Status</b>
1	Ezgeleh earthquake, Iran-Iraq	ASI	ongoing



## Outstanding issues

Renewal letter to be sent for the Iceland volcano Supersite (it has been approved at SIT 33). Pleiades data request to be intended for stereo coverage. Image quota by CNES to be finalised.

The Biennial reports for Marmara, Etna and Campi Flegrei have received comments from ASI and DLR. Some comments have been already addressed by Supersite Coordinators. For Etna Giuseppe Puglisi will address comments later on.



## Issues with EO data sharing

The DLR portal is temporarily offline due to issue with the new EU personal data protection policy. Can DLR provide a timeline for its re-opening?

The scientific community continues to ask for being given the possibility to access satellite data through web services. As for the Sentinel data this would allow to discover and download the data from any interface, and put in place automatic processing chains.



## Issues with EO data use

Some agencies complain that their data seem to be not frequently processed or used, or even downloaded from the archive.

In some cases (not all) the reason is that due to the low dynamics of the processes under study there is no immediate need to process the data. Normally scientists wait for the occurrence of a clear signal of increased deformation (measured by the ground networks).

However, even during periods of quiescence the data must still be acquired even if not processed, since the continuity of the time series is fundamental for future studies. Long term time series are at the base of scientific research and thus are a fundamental component of the Supersite concept.





## News from the Supersites

- The San Andreas Fault Natural Laboratory has eventually started activities. The Coordinator has ordered TSX and CSK data.
- Researchers of the Instituto Geofisico (Ecuador Supersite), Technical University of Aachen (Ezgeleh Event Supersite), Servicio Geologico Colombiano, INGEMMET, INAIGEM and other institutes, have been trained of InSAR cloud data processing using Sarscape in the EVER-EST platform. They are actively using the processing services.
- Due to changes in the management at EPPO, the Coordinator of the Greek Supersite Alexandros Savvaidis has resigned, and we are waiting for indications by EPPO on the new Coordinator.



## New proposals

- The proposal for a new multihazard Supersite in Peru has been reviewed by SAC and some amendments requested to the proposers but they have not submitted a revised version yet.



## Capacity building

- We had a meeting with the GEO Capacity Building Coordination Task Team. They provide information on capacity building initiatives worldwide. The new GEOSec Director has asked for a more relevant role of CB in GEO and this group is now trying to address this mandate.
- We have started to collaborate with USGS VDAP for training on the use of the EVER-EST platform for South American scientists of several volcano observatories. A first course was given in Colombia in February 2018, another is planned for 2019 in Peru.



## Addressing action M 9/9

*Action M9/9:*

*Look at existing supersites list and make recommendations on which ones might be expanded to include other hazards and work on risk assessment*

These Supersites are potentially interesting:

Virunga Supersite – there is already one area (Baku) which is affected by a large landslide and is included in the Landslide Pilot; there is need of updated land use maps to evaluate possible impacts of eruptions, and also vulnerability maps.

Iceland Supersite – for glacial-related hazards and landslides.

Ecuador Supersite – landslides and urban subsidence in Quito.

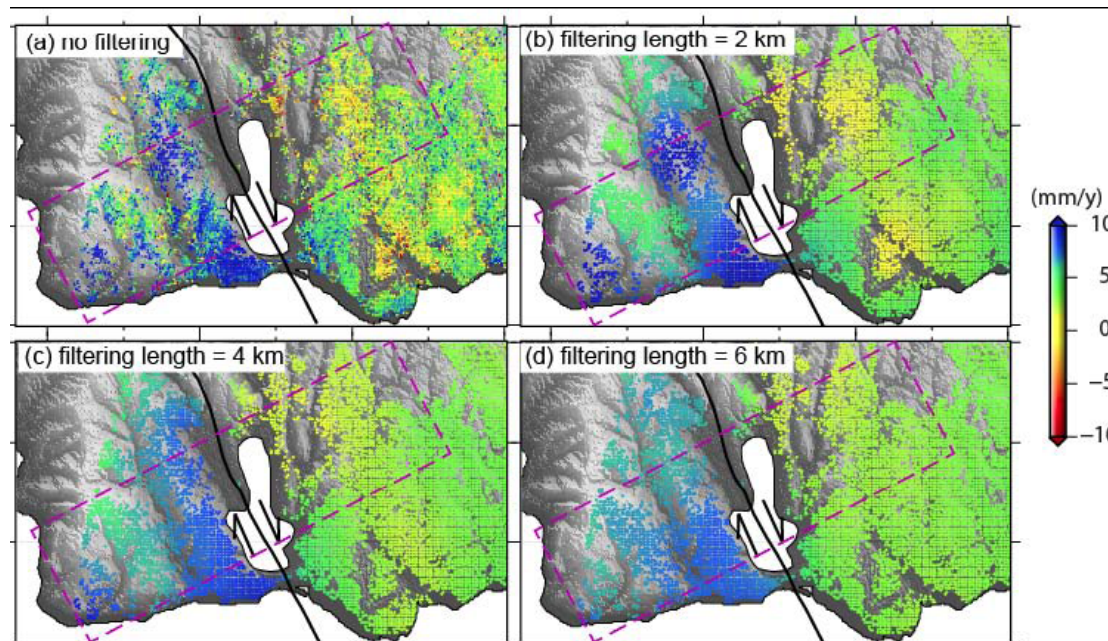


## Results from the Supersites

- Marmara (from biennial report 2016-2018)
- Ecuador
- Campi Flegrei
- Taupo, NZ
- Iceland
- Virunga

## Results from Marmara Supersite

Researchers mapped for the first time creeping along a secondary fault of the NAF system, along the Küçükçekmece Lake, using ENVISAT data. The movement occurred during the post-seismic period of the Duzce earthquake.

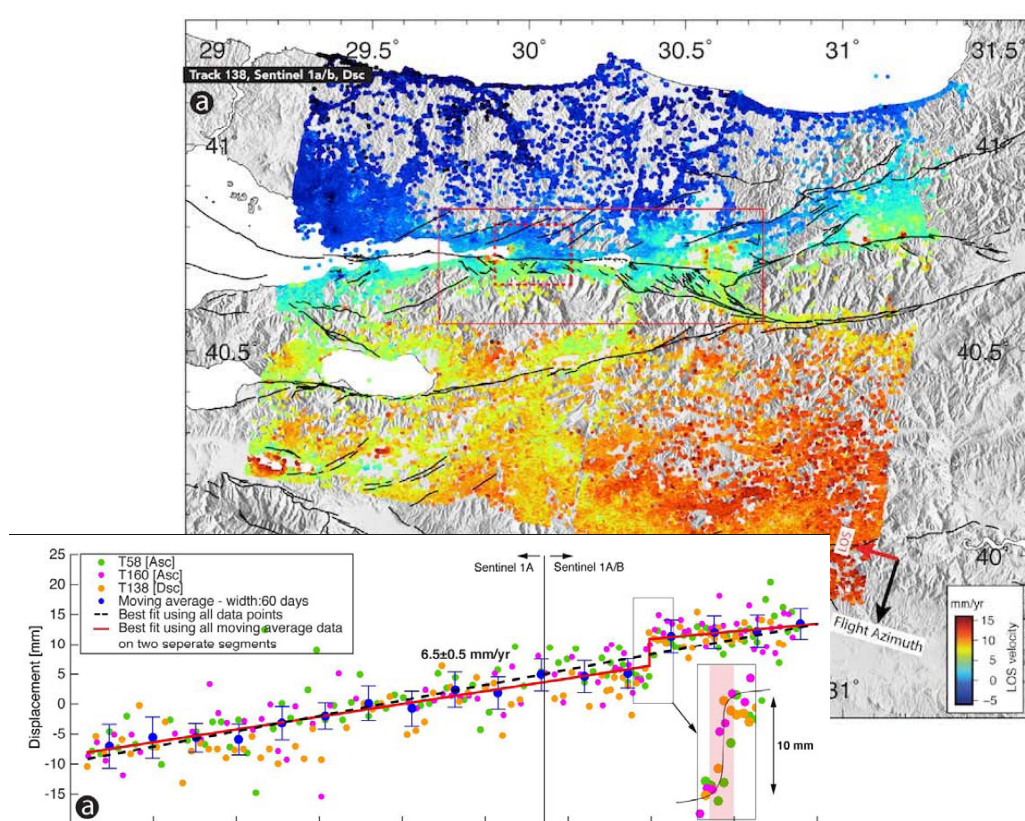


A collaboration among:

- Institute of Geodesy and Geophysics, Chinese Academy of Sciences, China
- GFZ – Germany
- e-GEOS, Italy
- KOERI, Turkey
- DLR, Germany

## Results from Marmara Supersite

Mean velocity from TerraSAR-X and Sentinel 1 images for the period 2011-2017 reveals that creep on the central segment of the 1999 Izmit fault rupture continues to take place more than 20 years after the earthquake.



A collaboration among:

- Université Grenoble-Alpes, France
- Istanbul Technical University, Turkey
- KOERI, Turkey
- Université de Lyon, France
- Physics of Geological Processes, Norway

Aslan et al., 2018



## Comments from the Marmara Supersite

Radarsat data were only provided as archive, but were not easily usable since too few images are available in the archives. The request would be to extend the quota and allow tasking of specific areas.

The process of ordering and maintaining the Supersite archives of satellite images is time consuming. A technological solution like that used for the Sentinels is advisable.

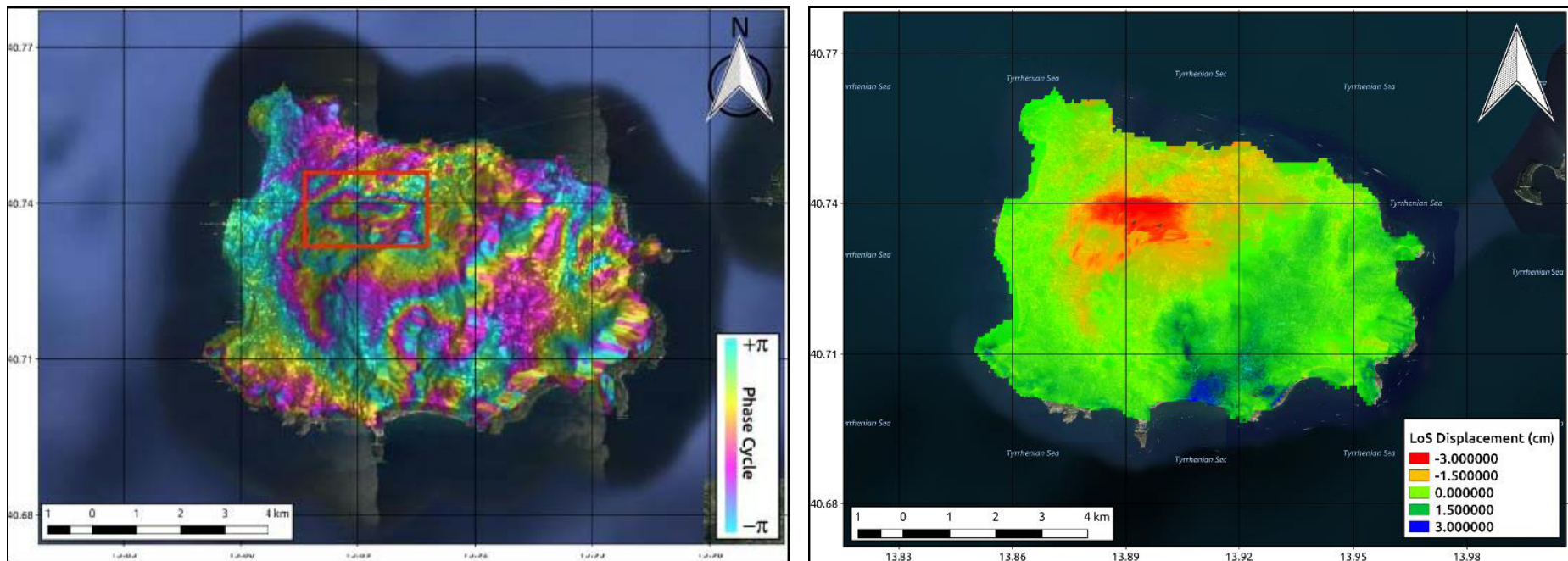
Standardization of InSAR result formats is being agreed in EPOS and should be adopted soon to facilitate scientific research and ensure a wider use of satellite data products.





# Results from Campi Flegrei Supersite

Based on CSK and S1 data INGV mapped the ground deformation caused by a very shallow earthquake occurred on August 21st, 2017, with  $M_w = 3.9$ , which caused 2 casualties. Using the deformation fields they identified the probable source.



Albano et al, 2018, in press on Geosciences



## Comments from Campi Flegrei Supersite

Spotlight TSX data were kindly granted during the seismic crisis of August 21st 2017. The post-seismic time series was not processed since Spotlight interferograms are very decorrelated. INGV thus did not renew the Spotlight tasking.

However in 2018 there was another shallow earthquake with  $M = 2.5$ , and the situation needs to be monitored with a longer term perspective, so the request is **to permanently add the coverage of the Ischia Island with TSX Stripmap.**

The area is already covered by CSK, but it is useful to have also TSX since it maintains a much smaller perpendicular baseline and ensures smaller spatial decorrelation.