GROUP ON EARTH OBSERVATIONS

Geohazard Supersites & Natural Laboratories

Status of the GSNL initiative

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Chair of the Supersites Advisory Committee

CEOS WG Disasters meeting, Rome, March 2017

Active Supersites

1. **Hawaiian volcanoes** – USGS, USA
2. **Icelandic volcanoes** – Univ. of Iceland & IMO, Iceland
3. **Etna volcano** – INGV – Catania, Italy
4. **Campi Flegrei volcano** – INGV – Naples, Italy
5. **Western North Anatolian Fault** – KOERI – Istanbul, Turkey
6. **Taupo Volcano** – GNS Science - Lower Hutt, New Zealand
7. **Tungurahua/Cotopaxi volcanoes** – IGEPN – Quito, Ecuador
8. **Evoikos, Corinth rift, Ionian Sea** – ITSAK – Athens, Greece

Supersite reporting status

Supersite	Biennial report due date	Status
Hawaiian volcanoes	25-Oct-16	2nd report delivered, to be approved at SIT
Icelandic volcanoes	5-Nov-17	2nd report
Etna volcano	9-Apr-18	2nd report
Campi Flegrei volcano	9-Apr-18	2nd report
Western North Anatolian Fault	9-Apr-18	2nd report
Taupo Volcano	29-Oct-16	1st report, to arrive before SIT
Tungurahua/Cotopaxi volcanoes	29-Oct-16	1st report, to arrive before SIT
Evoikos, Corinth rift, Ionian Sea	8-Nov-18	

February 21st: kick off of the of the EnCeladus hellenic Supersite (Evoikos, Corinth rift and Ionian Sea)

- EO data acquisitions started
- PoCs were identified for each EO data type
- First contacts with space agencies for ordering and access procedures
- In situ data will be shared through EPOS
- Coordinator (A. Savvaidis) is very proactive
- Good outreach plan

Status of the San Andreas Fault Natural Laboratory

- Positively reviewed by SAC.
- Proposal reviewed by DCT.
- ESA, DLR and ASI have expressed the intention to support the NL.
- Letter of support by USGS (new rule) received by GSNL Chair.

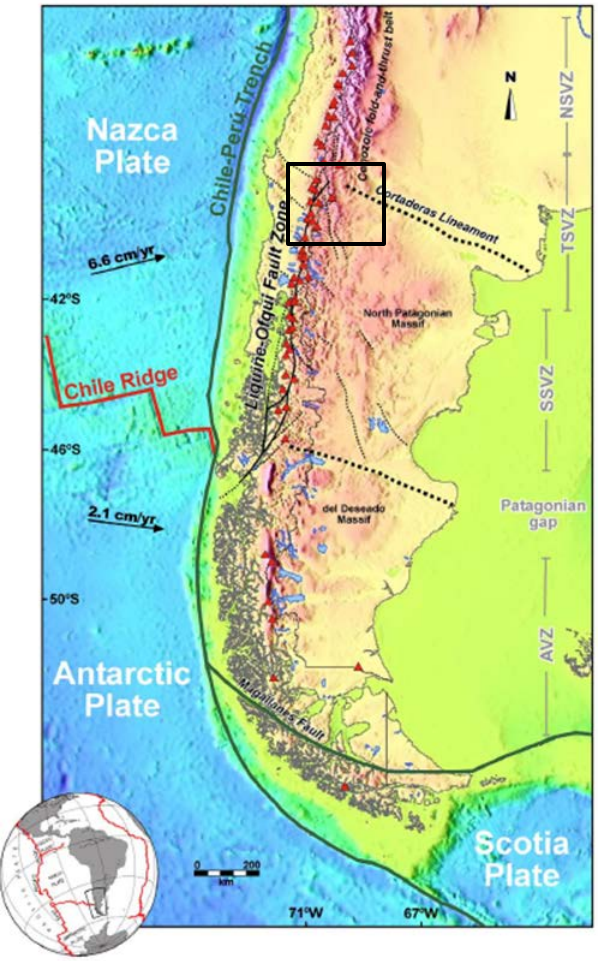
We propose to approve the NL at the SIT meeting.

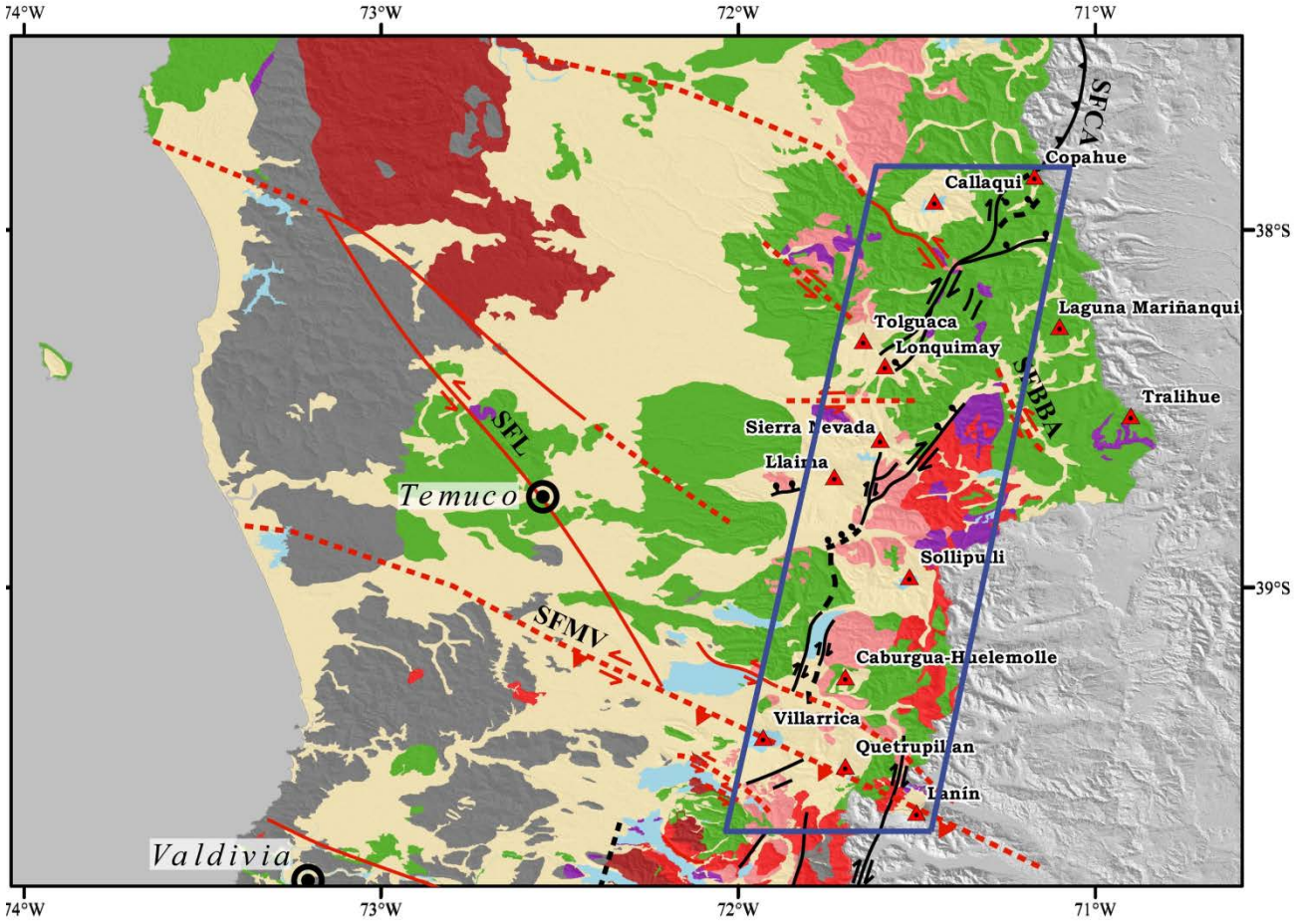
New Supersite proposals

- **Sinabung volcano Event Supersite** (M. Poland, USGS) - positively evaluated by DCT (DLR, ASI)
- **Permanent Supersite in the Southern Andes** (L. Lara, SERNAGEOMIN) – under review by SAC
- **Permanent Supersite on the Virunga volcanic zone**, D.R. of Congo (C. Balagizi, Goma Volc. Obs.) – to be submitted soon
- Other proposals to be presented/discussed at the EGU conference in April

Permanent Supersite proposal:

Coupled geohazards at Southern Andes: Copahue-Lanín arc volcanoes and adjacent crustal faults (GeoHaZSA)





Coupled geohazards at Southern Andes: Copahue-Lanín arc volcanoes and adjacent crustal faults (GeoHaZSA)

General features:

- ~50 x 200 km area, covering 9 stratovolcanoes, 2 volcanic fields, a large strike-slip fault
- Strong volcanic hazards - lahars, tephra fallout, ash plumes; + seismic hazard
- 80 eruptions since the 1900
- Potentially affected population ~200 k
- EO data not widely used, little local capacity
- GEO Chile strongly supports the proposal

Coupled geohazards at Southern Andes: Copahue-Lanín arc volcanoes and adjacent crustal faults (GeoHaZSA)

Main goals:

- To establish regional source models for faults/volcanoes.
- To develop a rapid strategy for ground deformation monitoring based on InSAR.
- To develop an early warning system for volcanic unrest based on InSAR, GPS, seismicity and gas measurements.
- To improve capability to measure effusion/emission rates.
- To generate high resolution hazards maps.
- To provide information to first responders, society and scientific communities.

Coupled geohazards at Southern Andes: Copahue-Lanín arc volcanoes and adjacent crustal faults (GeoHaZSA)

In situ data sets:

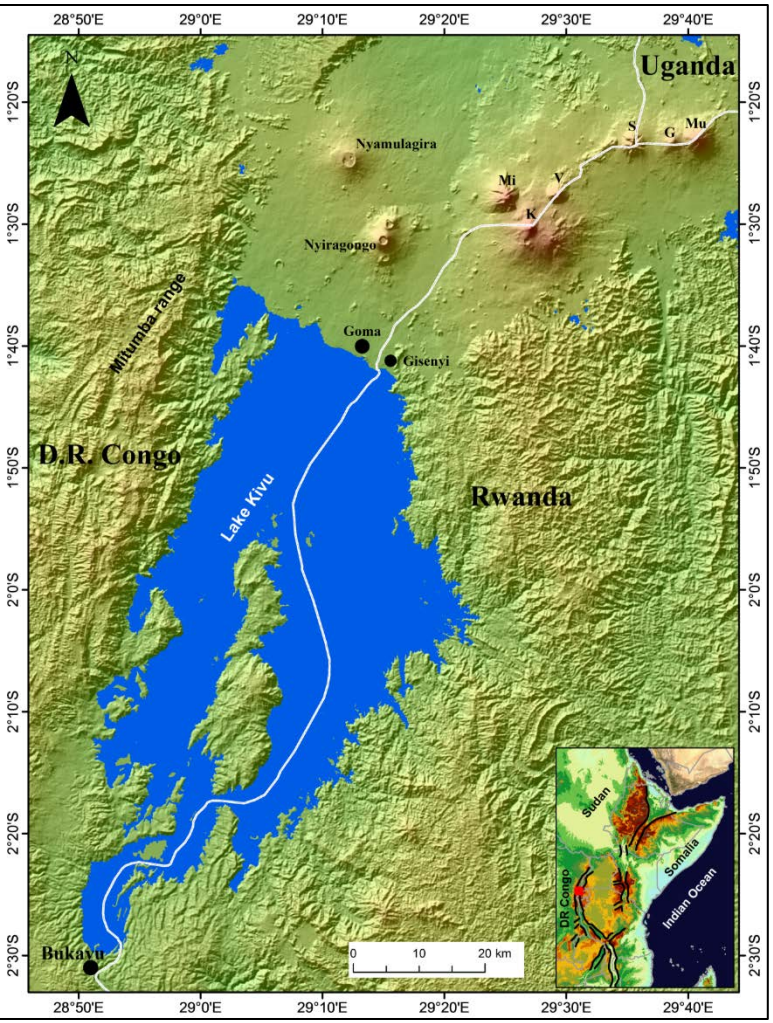
Type of data	Data source	Data access
Seismic data	*SERNAGEOMIN (OVDAS) network (35 stations)*	*Open access with registration form; server to remote download scheduled. Time-series for registered scientists under specific agreements*
GNSS data	*SERNAGEOMIN (OVDAS) (16), IGM (1) and CSN (1) network and GPS Campaigns*	*Open access to GNSL scientists*
DOAS and Gas measurements	*SERNAGEOMIN (OVDAS) network (5 continuous stations) and Campaigns*	*Open access to GNSL scientists*
Infrasound	*SERNAGEOMIN (OVDAS) 2 stations*	*Open access to GNSL scientists*

Coupled geohazards at Southern Andes: Copahue-Lanín arc volcanoes and adjacent crustal faults (GeoHaZSA)

EO data requests:

Type of data	Data source	Data needs (tentative)
SAR X-band	*ASI - DLR*	*Ascending/descending coverage every two weeks for 11 volcanic zones: ~ 560 images/yr* *Can be focused on more active volcanoes.*
SAR C-band	*ESA – CSA*	*Ascending/descending coverage every two weeks for 1-2 sites (fault/volcanoes): ~ 100 images/yr*
SAR L-band	*JAXA*	*Would be extremely useful.* *Perhaps within a scientific AO ?*
Optical data	*CNES*	*One initial tri-stereo coverage for each volcano, then one more each time there are substantial morphological changes (1-2 per year on average?)*

Upcoming Permanent Supersite proposal:
Virunga volcanic area (Democratic Republic of Congo)



- Area accounts for 40% of historical African eruptions
- High volcanic risk for over 1.5 M people (Goma city)
- Strong need for scientific investigations of the volcanic system
- Very poor in situ monitoring capacities
- No EO data are used, but would be very useful (part of the area is a war zone)
- Potential strong societal benefits from international collaboration.

GSNL to include other scientific goals

- The success of the Supersites has stimulated other communities to adopt the same concept in different contexts.
- Requests have been received to include other geohazards, as landslides, glacial outbursts, basin overflows, ground subsidence.
- These hazards can be investigated on existing Supersites (e.g. Cotopaxi)
- But also on multiple hazard Supersites under discussion (Peru)
- Further discussions are envisioning “olistic” Supersites, to study the Earth Critical Zone, considering geological, biological, ecological, biogeochemical, climatic and biogeographical aspects, as well as their relationship with the anthropogenic impact on the environment
- The GSNL community will discuss these new ideas at the EGU 2017 in Vienna

GSNL Data Policy guidelines

- Guidelines setting the minimum requirements for data sharing, licensing and attribution, compliant with GEO principles
- Refers to both in situ and satellite EO data
- Data, metadata and products should be openly shared
- It recognize the existence of exceptions due to commercial obligations, or other impediments
- It is fully compatible with the space agencies' data policies and licenses

New GSNL website

- Contract for redesign just awarded by INGV
- It will be placed outside of the GEOSec website
- It will be the main point of access for the Supersite network, containing web pages for each Supersite whose content will be self-managed by the Coordinators
- It will provide better visibility of Supersite achievements
- It will provide a coordinated view of the GSNL resources contributed by the partnership, directing the users to the various data/product/service portals (e.g. UNAVCO, IRIS, GEP, DLR portal, EarthExplorer, EVER-EST, EPOS, etc.)

Issues with EO data access

- DLR portal ok but two issues remain with compatibility with UNAVCO's SSARA: multiple data sets in one tar file, and unnecessary need for cookie updating
- ASI data still not available online. We asked the GEP to host the data and make them downloadable.
- Same solutions foreseen for CNES and CSA data, but the data PoC needs to manage authorizations
- Need to explore if the new GEOSS portal can distribute data to authorized users
- ALOS-2 data still not provided to GSNL. Will it be possible to use an AO?