Questionnaire: Geohazard Supersites and Natural Laboratories

Component of GEO 2012-2015 work plan: C2 Geohazards Monitoring, Alert, and Risk Assessment
Priority action: Establish Geohazards Supersites and Natural Laboratories
Area: DISASTERS (GEO Secretariat, Francesco Gaetani, FGaetani@geosec.org)

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Purpose of this Questionnaire:
1. Collect contributions for the development of a global network of Natural Laboratories (including designation of Point-of-Contacts for the establishment of event Supersites).
2. Provide guidance to the Scientific Advisory Committee (SAC) for selecting Candidate Supersites.

Who should respond?
1. Geohazard monitoring agencies interested in participating in the initiative.
2. Scientists with particular interests in specific geohazard regions.

What are the selection criteria for Candidate Supersites?
The criteria are (1) the potential for new scientific discoveries, (2) vulnerability to geohazards and (3) commitment to GEO data sharing principles.

E-mail filled questionnaire to John Eichelberger (Americas), Massimo Cocco (Europe, Africa) or Falk Amelung (elsewhere). Information will be incorporated into the strategic plan under development (section 10.2, 10.3).

Proposed Candidate Supersite: La Réunion Volcanoes

Natural Laboratory: Piton de la Fournaise Volcano Observatory (OVPF)

Point of Contact (PoC): Andrea Di Muro, Piton de la Fournaise Volcano Observatory, Institut de Physique du Globe de Paris, dimuro@ipgp.fr

Monitoring Agency(s): Institut de Physique du Globe de Paris (IPGP)

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(*) to designate event Supersites in the case of volcanic unrest

Scientific rationale:	La Réunion Island is the most recent manifestation of the mantle plume that generated the Deccan Traps at the Cretaceous-Tertiary boundary. It represents the subaerial part of a 7 km high oceanic shield volcano with a diameter of 220 – 240 km and is composed by two adjacent volcanic edifices: Piton de Neiges (with most recent known eruption 24 ky ago) and Piton de la Fournaise that is the present-day active volcano at La Réunion. Recently, Piton de a Fournaise has been very active with more than 30 eruptions since 1998 and different types of events that caused large deformation of the edifice: summit and flank dyke injections, sills, flank destabilization, and caldera collaps. Historical events also include phreatomagmatic explosions and eccentric eruptions of primitive basalts along volcanic rifts. The eruptive activity of this volcano thus constitutes an important hazard to the growing population of La Réunion island (~850000 people with one third living in the vicinity of the volcano). The seismicity, deformation and eruptive activity of this volcano are well recorded by different in situ networks whose data are mostly openly available. Continuous gas monitoring is also in development. All this makes the Piton de la Fournaise a good candidate for a supersite. For this reason, it has been selected as one of test sites in the EU Supersite project MED-SUV.
SAR data needs (if known)	The results obtained in the framework of previous projects (ASI CSK #2080 and DLR LAN #237) have demonstrated the high potentialities of scientific gain provided by X-band InSAR data when used for the monitoring of Piton de la Fournaise and other unvegetated volcanoes. For this reason we recommend routine high frequency acquisitions of both ascending and descending Cosmo-SkyMed, TerraSAR-X and TanDEM-X data on Piton de la Fournaise. The ideal revisit time for regulr monitoring would be 8 days for the Cosmo-Skymed data and 11 days for TSX/TDX data (i.e. ~14 acquisitions monthly). During periods of strong activity, it would be desirable to increase the acquisitoin frequency to itspossible maximum. Stripmap mode provides ideal compromise between resolution and extension of covered area. When Sentinel-1 and ALOS-2 data will become available they will complete very usefully the X-band data.

In-situ observation networks[*]

Network (name,type)	# of stations	open data access	archiving organi-zation	Available from global facility (IRIS, Unavco, ISC, other)?	Interest in participating in data sharing demonstrator?[**]	Technical hurdles for participation in data sharing
OVPF seismic	30	yes	IPGP	RESIF (French seismic datacenter), IRIS soon	yes	Unsufficient technical staff
OVPF GPS	29	yes	IPGP	IPGP data center (Volobsis)	yes	Unsufficient technical staff
OVPF tiltmeters & Extensometer	12	yes	IPGP	IPGP data center (Volobsis)	yes	Unsufficient technical staff
OVPF geochemistry	6	yes	IPGP	NOVAC/volobsis	yes	Unsufficient technical staff
OVPF imagery	8	yes	IPGP	IPGP data center	yes	Unsufficient

(visible and IR)	(Volobsis)	technical staff

Relevant websites:
http://centrededonnees.ipgp.fr/
http://volobsis.ipgp.fr/
http://www.resif.fr
http://www.novac-project.eu/partners.htm

(*) This information will be used for a global inventory of in-situ data assets
(**) for an example of a potential global facility see
(http://www.unavco.org/pubs_reports/reports/annual/gsac/ROSES-GSAC-review-yr1.pdf)

Other comments:

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Submitted by: