

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)

Leads (GEO Member or PO, Entity carrying out the work, contact: e-mail):

Falk Amelung, University of Miami, USA, famelung@rsmas.miami.edu

Massimo Cocco, European Plate Boundary Observatory (EPOS) and INGV, Italy (massimo.cocco@ingv.it)

Craig Dobson, Committee of Earth Observation Satellites (CEOS) and NASA

Purpose of this Questionnaire:

1. Collect contributions for the development of a global network of Geohazard Supersites and Natural Laboratories.
2. Provide guidance to the Scientific Advisory Committee (SAC) for prioritizing and selecting new 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?

The selection criteria for new Supersites are (1) the potential for new scientific discoveries at a diverse set of geologic settings, (2) vulnerability to geohazards and (3) commitment to GEO data sharing principles (existing or planned open access to in-situ data). Geohazard monitoring agencies should take note of this window of opportunity. The rationale behind these selection criteria is to incorporate new Supersites using successful pilot studies.

Selection procedure: E-mail filled questionnaire to Falk Amelung with copy to winsar@unavco.org.

Proposed Supersites and Natural laboratories will be incorporated into strategic plan (section 10.2, 10.3).

The SAC will prioritize proposed sites. Decisions will be taken in collaboration with CEOS, the procedure is still under discussion and may involve more detailed proposals to CEOS.

Proposed Supersite:

Proposed Natural Laboratory: Dead Sea supersite

Point of Contact: Gidon Baer, Geological Survey of Israel, baer@gsi.gov.il

Monitoring Agency(s): GSI – Geological Survey of Israel
GII – Geophysical Institute of Israel
SOI – Survey of Israel

Scientist(s) involved: Gidon Baer, Geological Survey of Israel, baer@gsi.gov.il

Scientific rationale:

The Dead Sea Fault and the Gulf of Elat (Aqaba) form a continuous boundary between the African and Arabian plates. During the past two Millenia, earthquakes of magnitude 7 and larger struck the region at an average frequency of 200 years, causing damage and fatalities in populated regions on both sides of the fault from Lebanon and Syria in the north, through Jordan, Israel, and the Palestinian Authority, to Egypt and Saudi Arabia in the south. The most recent events were an *M* 7.3 earthquake in the Gulf of Elat (Aqaba) in 1995 and a magma-driven earthquake swarm in

	<p>the Harrat Lunayyir volcanic field, western Arabia between April and July 2009 with a peak M 5.7 shock. The DSRS region is unique in its rich and diverse geological and geomorphological features, such as salt diapirs, sinkhole collapses, groundwater-related subsidence, dormant and active volcanic fields, and more. Among the specific research questions and monitoring goals are the rates and distribution of crustal movements along the different fault segments, the rates and mechanisms of vertical movements, identification of volcanic unrest, sinkhole detection and precursors, etc.</p> <p>The high concentration of these features in a relatively small area, make it highly appropriate as a supersite, where they can be scientifically studied and monitored, their potential hazards can be assessed, and their economic and societal implications can be determined.</p>
<i>SAR data needs</i>	<p>The northern part of the DSRS region, from the Lebanon Mountains in the north to the southern end of the Red Sea is well defined along the plate boundary. It is about 800 km long and less than 50 km wide. The width of the Red Sea margins is less defined, and may reach a few hundred km on each side of the sea. The required data should be of ascending and descending stripmap modes, with some spotlight images for specific features, and revisit times depending on the investigated problem and the expected deformation rate.</p>
<i>Data gaps:</i>	<p>If funding is made available, the priorities for in-situ observations are deployment of microseismic and campaign GPS networks around the various fault segments, sinkhole sites, volcanic fields, etc. Such networks are complementary to the InSAR observations providing temporal constraints and improving our understanding of the observed displacements.</p>
<i>Supporting organizations:</i>	Geological Survey of Israel

<i>In-situ observation networks</i>						
Network (name,type)	# of stations	open data access	archiving organization	Available from global facility (IRIS, Unavco, ISC, other)?	Interest in participating in data sharing demonstrator? (*)	Technical hurdles for participation in data sharing
GPS	~200	yes	GSI, SOI	SOPAC	yes	
Seismic	?	yes	GII	Yes	yes	
<i>Existing e-infrastructure</i>						
purpose	Internet URL (for inclusion into the Appendix of the strategic plan)					

(*) may require the installation of front-end web services and/or streaming into global facility (http://www.unavco.org/pubs_reports/reports/annual/gvac/ROSES-GSAC-review-yr1.pdf)

<p>Others:</p> <ol style="list-style-type: none"> How to facilitate better utilization of supersite data by end user (courses,...)? How to measure success and report this back to the data providers?

3. Other comments:

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Submitted by:
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