Sub-task Number: DI-09-01?
Sub-task Title: Supersites and Natural Laboratories

Overarching Task*:* Systematic Monitoring for Geohazards Risk Assessment
Area: DISASTERS
Related Community of Practice: Geohazards
Relevant Committee*: (to be determined in 2010)*
Related Targets: *(to be included in 2010)*

Sub-task Definition *(as given in the 2009-2011? Work Plan):*

Retrieval, integration and systematic access to remote sensing & in-situ data in selected regional areas exposed to geological threats ("Supersites") to improve geohazard monitoring, and to stimulate fundamental research on geohazards. The initial objectives is to dramatically enhance access to multi-satellite SAR data, GPS data, and seismic data for the already selected seven supersites (Phase 1 supersites) and for geological disasters (event Supersites). The intermediate objectives are: (i) to develop a supersite data portal, a one-stop internet access point for in-situ and remote sensing geophysical data; (ii) to facilitate SAR data access for selected, regional areas exposed to geological threats (Natural Laboratories) to better demonstrate the power of the supersite concept to improve geohazards risk assessment; (iii) to develop a governance structure for the supersites with representation from the science community and operational users, and from the contributing organizations. The long-term objective is to develop an international, sustainable and integrated approach to geohazards (Supersites and larger Natural Laboratories) optimally utilizing the remote sensing capabilities of GEO members.

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

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Scientific committee and Advisory (tbd).

Motivation/Background

The Supersite initiative began with the ***"Frascati declaration"*** at the conclusion of the 3rd International Geohazards workshop of the Group of Earth Observation (GEO), held in November 2007 in Frascati, Italy. The recommendation of the workshop was *"to stimulate an international and intergovernmental effort to monitor and study selected reference sites by establishing open access to relevant datasets according to GEO principles to foster the collaboration between all various partners and end-users"*. This recommendation is formalized as GEO task DI-09-01.

This recommendation was acted upon at the 2nd workshop on the Use of Remote Sensing Techniques for Monitoring Volcanoes and Seismogenic Areas" – USEReST, held in Naples, Italy in November 2008. A scientific session on potential Supersites was convened, followed by an open discussion about the Supersite concept. More than 25 workshop participants agreed to contribute ground-based and space-based data to the initiative. A key contribution is that from the European Space Agency who provides the IT infrastructure for an online SAR data archive (now known as ESA's "Virtual Archive").

It was agreed to start with initially seven supersites. These are the three volcano Supersites Mt. Etna, Vesuvius/Campi Phlegreii and Hawaii and the four earthquake Supersites Istanbul, Tokyo, Vancouver/Seattle and Los Angeles.

Current Status

A temporary Supersite website has been set up at http://supersites.unavco.org. This website provides access (or information about access) to the complete ESA SAR data holdings for the Supersites, and to publicly available GPS and seismic data. The access to the ESA data is provided in the framework of a Category-1 project between the GEO secretary (Jose Achache) and ESA. The archived SAR data was contributed by community members whereas the new imagery is provided by ESA.

The website is currently based at Unavco in Boulder, USA. Unavco is the home of the Western North America InSAR consortium (WInSAR) and has extensive experience with SAR and GPS data. In the long-term, the Supersite initiative is expected to be led by the Science communities in Europe (European Plate Observing System program, EPOS), in North America (Western North America InSAR consortium, WiNSAR) and Asia (Japan and China; tbd; PIXEL is a candidate)

The Supersite initiative was discussed at round-tables/break-out sessions at two scientific workshops in 2009 (ALOS PI meeting, November 2009, Hawaii and the Fringe 2009 workshop in Frascati, Italy) and was very positively received by the Science community.

Required Action

- The Supersite initiative currently lacks a sustainable governance structure and a strategic planning document. The top priorities are to develop a near-term working plan (White Paper), to develop By-Laws and Scientific and Advisory committees and a strategic planning document (***Action: Geohazard CoP***).
- Provide multi-satellite SAR data for Haiti earthquake (http://supersites.unavco.org/haiti.php). Of particular importance are ALOS data (***Action: JAXA***).
- Provide ground-based data for Hawaii and Etna volcano Supersites **(*Action: USGS, INGV*)**
- Provide missing space-based data for current Supersites (ESA and DLR have already agreed to participate **(*Action: JAXA, CSA*)**
- Give ESA mandate to lead the space component of Supersites together with Science community. ESA has done excellent job but this effort is not well recognized within ESA. Design GEO task-sheet with this respect (***Action: Geohazard CoP***).
- Encourage collaboration on current Supersite/Natural Laboratory approach between ESA, Science Community (WinSAR/Unavco) and NASA (ESA provides IT infrastructure ,NASA funds WinSAR/Unavco). The current bottleneck is lack of personal at Unavco (***Action: NASA***).
- Develop response protocol for data delivery for earthquake/volcano disasters (incorporate science needs in Disaster Charter satellite acquisition). (***Action: CEOS***)
- Hold well-planned workshop on Supersites/Natural laboratories/event Supersites with representatives of GEO, the Science community and the Space Agencies (WinSAR, EPOS, Unavco, PIXEL, USGS, JAXA, CSA, DLR, NASA, etc) to develop a roadmap for the Supersites and address disaster reponse. This corresponds to developing a Supersite/Natural Laboratory Community of Practice as part of the larger Geohazard CoP. Workshop could be held in June 2010 in Bergen before/after ESA's Living Planning meeting (***Action: GEO, ESA***).
- Continue developing SAR data access for Natural Laboratories. One of the top priorities is Sumatra because of extreme geohazard and excellent data sets not available to the science community (a 1000 image Radarsat-1 data set is archived at the Malaysia Center for Remote Sensing (MACRES) (Action: GEO, MACRES, Malaysia)

Milestones

- **Bergen 6/2010 Symposium**. Full Supersite structure in place (complete data sets for the Supersites and for the Haiti event Supersite),
- **GEO Plenary Nov 2010**. Presentation of Supersites as GEO outstanding success
- 7/2010 –Supersite Scientific and Planning meeting at one of the selected Supersites.

Resources *(indication of resources – e.g. financial, human – contributed by GEO Members or Participating Organizations to produce outputs)*

The initial principal contributors are ESA, Italy and USA because it is planned to develop the American and Italian supersites into example supersites:

- ESA provides the IT infrastructure for SAR data distribution (ESA's "Virtual Archive")

- Unavco/WinSAR (USA) is providing manpower to maintain the Supersite website (Unavco's sponsors organizations are NASA and the National Science Foundation).
- INGV and CNR (Italy) organized the November 2008 workshop.
- USGS (USA) and INGV (Italy) are/will be contributing initial SAR and ground-based data.

Capacity Building Component

(capacity building is defined to include the development of capacity related to: (i) Infrastructure and technology transfer (Hardware, Software and other technology required to develop, access and use EO); (ii) Individuals (education and training of individuals to be aware of, access, use and develop EO) and (iii) Institutions – building policies, programs & organizational structures to enhance the value of EO data and products).

1) In accordance with the above definition does this Task have a capacity-building component? If so, please provide a short description of this component including a description of end users.

Capacity building is one of the key ideas of the supersite concept. The ready access to SAR and multi-instrument ground-based data provides unprecedented training opportunities will lead to a new generation of geoscientists using multiple datasets for geohazard assessment and research.

User Engagement Component

(please briefly describe to what extent end users are engaged in this Task and influence the nature of the outputs produced)

The Supersites provide national geohazard monitoring agencies such as volcano observatories and geological surveys with access to Space data and a forum to express their data needs to the satellite data provider.

Related tasks

This task is the overarching task for the already existing task DI-09-01a "Vulnerability Mapping and Risk Assessment" lead by Prof. Fabio Dell'Aqua at the EUCENTRE, Pisa, Italy. The initial geographical focus of this task is Messina, Italy. Messina will be proposed as a Phase 2 Supersites. If accepted DI-09-01c will provide the remote sensing data for DI-09-01a.

Participation:

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