Report of the Geohazards Community of Practice

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with input from
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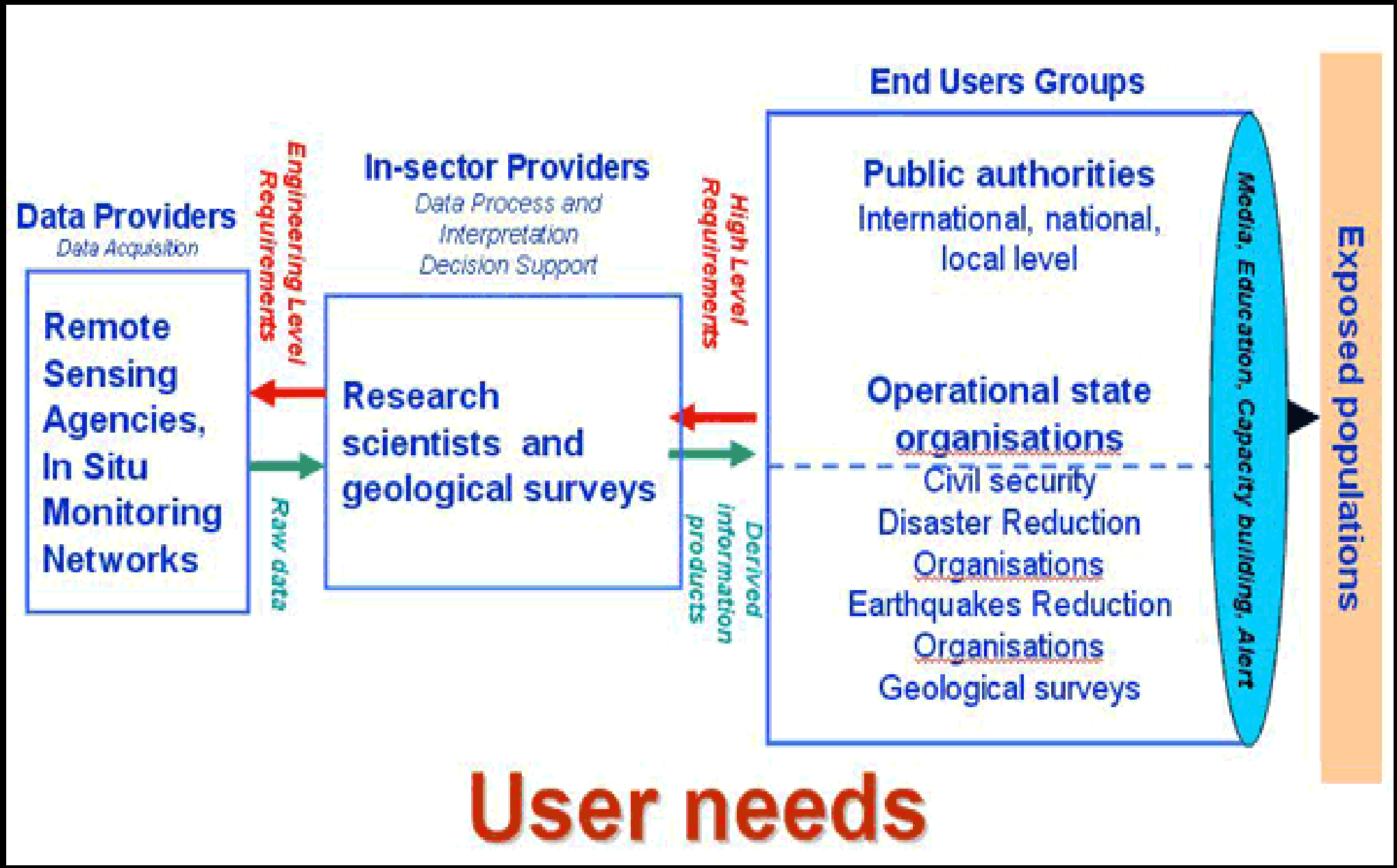
GEO Community of Practice

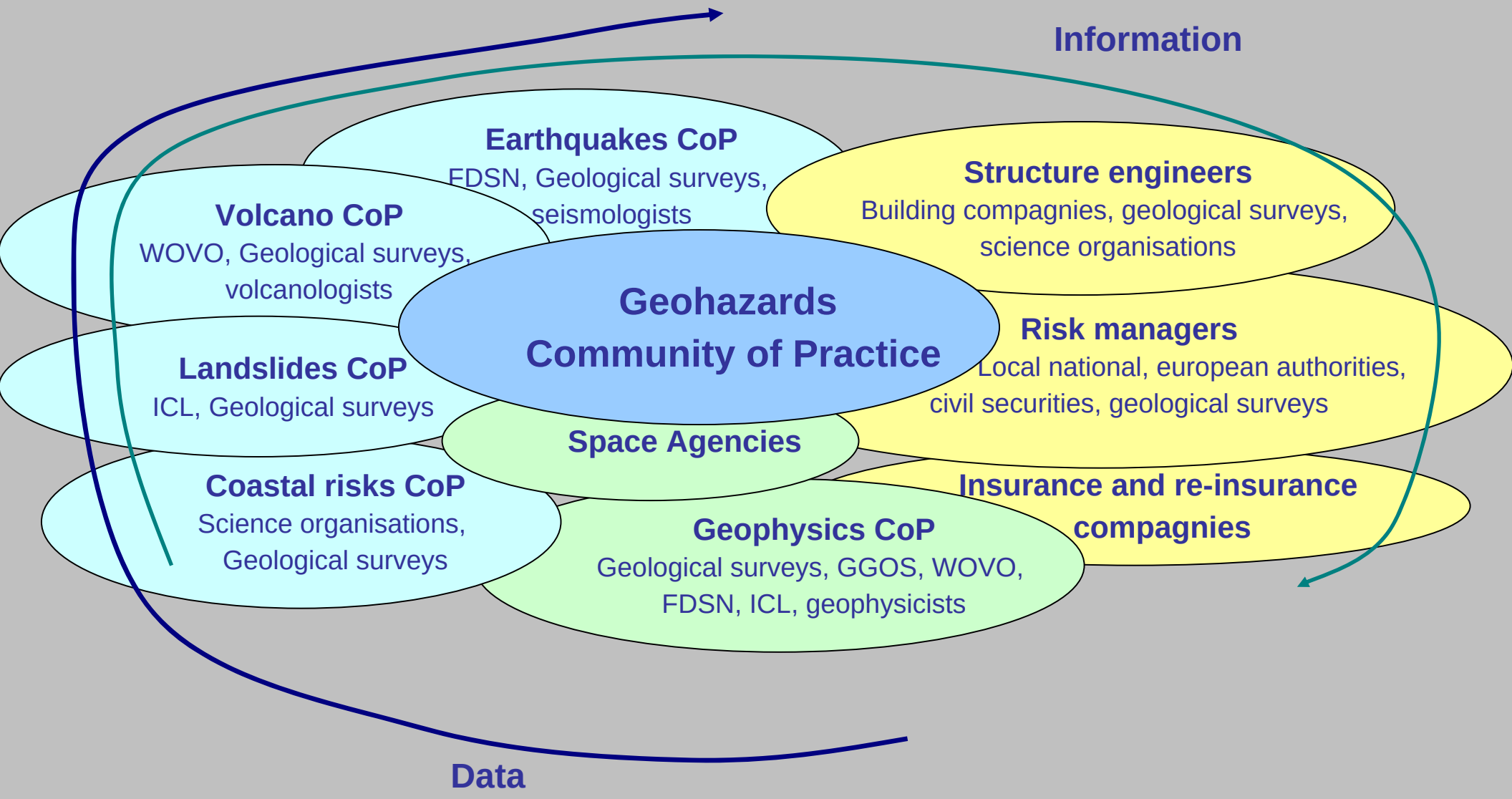
IGOS Geohazards Theme:
- participates in GEO since 2005
- provides core for the Geohazards Community of Practice

Geohazards CoP:
- aims at bringing together any person or entity concerned with Geohazards ;
- particular focus on users and beneficiaries, with exposed populations being the main beneficiaries of an improved hazard monitoring;
- federate a community that acts as a bridge between users and exposed populations, which produces efficient alerts, information and education tools to limit consequences of natural disasters (includes media, local authorities, schools and alert system managers);
- three main groups involved in the CoP have been identified.

IGOS Geohazards Transition to GEO Community of Practice



GEO Geohazards Community of Practice



GEO Community of Practice

Membership:
- Broad membership on a more *ad hoc* basis
- No clear boundary to IGOS Geohazards Theme or the International Geohazards Initiative
- No designated Lead

GEO Geohazards Community of Practice

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GEO Community of Practice - SeaMonkey

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Back Forward Reload Stop http://www.igosgeohazards.org/geo_community_of_practice.asp Search Print

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- IGOS Geohazards Initiative
- GEO Community of Practice
- IGOS Geohazards Bureau
- Workshops / Meetings
- Documents
- Newsletters
- GeoHazData: Editor | Viewer | Map
- Members area
- Contact
- Home

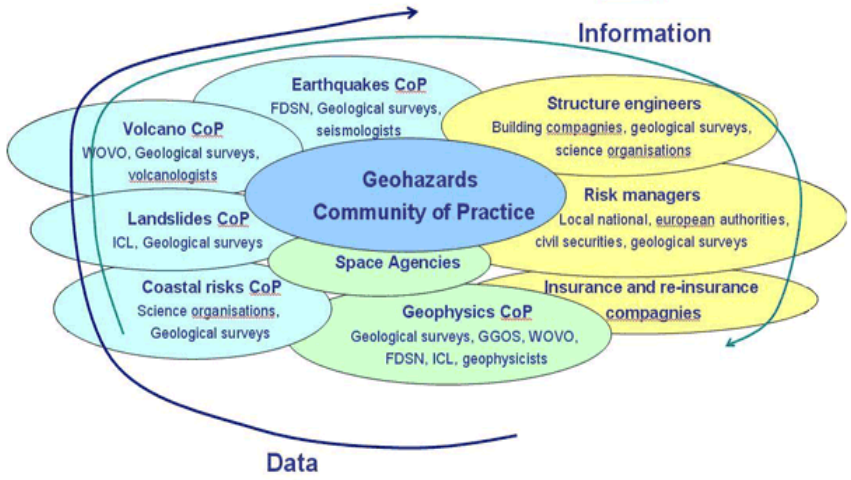
GEO Community of Practice

Since its inception, the IGOS geohazards theme has been a bridge between high level policy makers such as UNESCO and the geohazard community. This role has gained weight through the interaction with the Global Earth Observing System of Systems (GEOSS) currently established by GEO. The GEOSS project helps production and management of observations in a way that benefits environment and humanity. GEOSS is envisioned as a large national and international cooperative effort to bring together existing and new hardware and software, making it all compatible in order to supply data and information at no cost.

Improving access to Earth observations is one of the main objectives of GEO and complements the IGOS Partnership initiative with larger scopes. GEOSS will be developed in order to respond to the needs of the society for:

- Easier and more open data access;
- Informed decision making;
- A better Earth Observing System.

The Geohazards Communities of Practice (CoP)



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Newsletter

Back Forward Reload Stop http://www.igosgeohazards.org/newsletters.asp

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- IGOS Geohazards Initiative
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- Documents
- → Newsletters
- GeoHazData
  - Editor | Viewer | Map
- Members area
- Contact

Newsletters

- GeoHazUpdate Issue 6 - January 2008 (PDF file, 1,2 Mo)
- GeoHazUpdate Issue 5 - May 2007 (PDF file, 1,2 Mo)
- GeoHazUpdate Issue 4 - February 2007 (PDF file, 975 Ko)
- GeoHazUpdate Issue 3 - October 2006 (PDF file, 875 Ko)
- GeoHazUpdate Issue 2 - June 2006 (PDF file, 731 Ko)
- GeoHazUpdate Issue 1 - October 2005 (PDF file, 146 Ko)

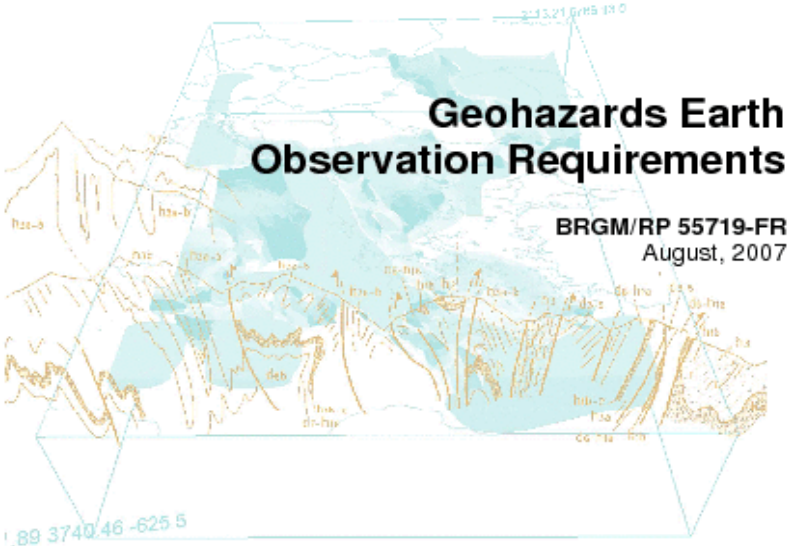
http://www.igosgeohazards.org/newsletters.asp

Contributions to GEO

Current contribution of the Geohazards CoP (together with IGOS Geohazards Theme/Geohazards Initiative) to GEO:

- contributes to
  - > DI-06-07: Geohazards Bureau provides a pilot OGC-compliant catalogue and web service for hazard maps inventory (GeoHazData),
  - > DI-06-03: Geohazards Bureau organizes workshops and raises awareness on InSAR and advanced InSAR techniques in the Geohazards CoP.
  - > DI-06-02 through user feedback from regional workshops;
  - > DI-06-08 through the promotion of an integrated approach;
  - > DI-06-09 through identification of geological high risk areas;
  - > DI-06-12 through organization of user workshops in Latin America and South East Asia; and
  - > AR-06-05 with GeoHazData;
- provided the GEO UIC with Geohazards Earth Observation Requirements in August 2007

Contribution to GEO



Published August 2007
- describes geohazards, scenarios, forecasts, and response

Geohazards Earth Observation Requirements

BRGM/RP 55719-FR
August 2007

Study carried out by the ESA-BRGM jointly funded IGOS Geohazards Bureau

BRGM 2007 PDR04ARN61

ESA ESRIN Contract No. 18349/04/I-IW

G. LeCozannet, J.Salichon, BRGM

Reviewed as part of the Geohazards Theme report by Andy Gibson, BGS, Steven Hosford, CNES, Chu Ishida, JAXA, Kay Mc Manus, BGS, Warner Marzocchi, WOVO, Robert Missotten, UNESCO, Hormoz Modaressi, BRGM, Marc Paganini, ESA, Hans-Peter Plag, GGOS and Helen Reeves, BGS

Contribution to GEO

3.2. MOST REQUIRED OBSERVATIONS FOR EACH TYPE OF GEOHAZARD

3.2.1. Volcanic hazard

REQUIRED OBSERVATIONS	BACKGROUND MONITORING/ASSESSMENT	DURING AND AFTER THE CRISIS
Characterise seismicity of volcano or group of volcanoes (magnitude, 3-D location, and type of earthquake)	Individual volcanoes require at least 3-6 seismometers, ideally with 3-directional sensors, to detect and locate earthquakes of magnitude 0.5, with digital data relayed/processed in real time	Repairs as needed and feasible
	Regional network good enough to detect and locate earthquakes of Magnitude 2.5, data relayed and processed in real time	Additional stations, deployed near or on the volcano, to detect and locate earthquakes of Magnitude 0.5
Characterise deformation of volcanic edifice (horizontal and vertical); monitor changes in gravity; characterise topography; determine location of faults, landslides and ground fractures	EDM and/or permanent GPS network of stations, either continuously transmitting or reoccupied as necessary	Additional GPS stations as needed to capture deformation; more frequent occupation (if data not continuously transmitted)
	Levelling and tilt networks surveyed as needed. Borehole strainmeters (continuous recording). Gravity surveys (1-5 years)	More frequent occupation (if not continuously recorded and transmitted)
	SAR interferometry	Request more frequent tasking plus search data archives for additional possible image pairs
	Map existing geologic structures on volcanoes using high spatial resolution satellite, aerial photography, aerial surveys and geological and geophysical ground surveys as needed.	Request repeat overflights to check for new cracks; possibly install strainmeters across selected cracks
Characterise gas and ash emissions of volcanoes by species (SO_2, CO_2) and flux (tons per day)	COSPEC, LICOR surveys at regular intervals (weekly, monthly or annually).	More frequent surveys, perhaps using small aircraft if plume not accessible by road
	Routine checks through appropriate satellite imagery. (LEO and GEO)	Additional requests tasking for higher-resolution data, check archives for usable Imagery
Characterise and monitor thermal features of volcanoes (their nature, location, temperature, possibly heat flux)	Map and monitor hot springs, fumaroles, summit craters, crater lakes, and fissure systems for temperature variations using ground-based instruments and high spatial resolution satellite data.	More frequent observations, including visible and IR photography and pyrometry as appropriate
	Systematic acquisition and analysis of imagery from airborne digital IR cameras, moderate resolution to higher-resolution resolution satellite imagery for thermal background and thermal flux.	More frequent overflights with digital IR camera; additional requests tasking for higher resolution satellite data, check archives for time series of thermal data
Characterise eruptive style and eruptive history of volcanoes	Characterise, map and date all young eruptive deposits of the volcano	Observe eruption columns, plumes and surface deposits (using overflights with visible and IR photography, video). Monitor their motions (speed, direction, areas covered and threatened), character, and thickness. Update maps

Table 6: Volcanic hazard observations most commonly required and the best available observational systems. (After IGOS Theme report 2004). This table only include data needed for hazards observations. The assessment of dammages through remote sensing means falls within the scope of the International Charter "Space and Major Disasters". Due to the lack of holistic scientific litterature in this field the data requirements for the assessment of vulnerability could not be presented in these users requirement document.

Published August 2007
- describes geohazards, scenarios, forecasts, and response
- describes data requirements

Geohazards Earth Observation Requirements

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Frascati Declaration

We, as experts in the field of Geohazards, participating to the 3rd International Geohazards Workshop,

...

recommend

...

- 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

...

- to maintain and build a coordination body to ensure the further development of the Geohazards initiative and Community of Practice

Geohazards Initiative and Supersites

Concept paper on the International Geohazards Initiative

An international Earth Observation strategy to reduce geological risks and its application to specific regional areas

(Draft Version 2)

The Concept Paper is the roadmap for the international Geohazards Initiative that:

- links research, long-term monitoring and operational programmes, bringing together the producers of global observations and the users that require them;
- responds to the scientific and operational geospatial information needs for the prediction and monitoring of geological hazards;
- builds on the work undertaken under IGOS Geohazards, the Geohazards, and the GEO Geohazards tasks;
- proposes an international cooperation framework to put in place recommendations of the Frascati declaration.

Geohazards Initiative and Supersites

Step one:

- aims at facilitating access to data over a certain number of regional areas ("supersites" or natural "geohazards laboratories").
- step one should be implemented for a few "Supersites" within 3 years.
- Eligible as a "Supersite" are regional area that meet at least one of the following criteria:
  - > populations and elements are exposed to geological threats;
  - > an event is expected to occur in the near future, or a slow process is already ongoing;
  - > it should be an appropriate place to stimulate basic geohazard research (earthquakes hazards, landslides, volcanoes, hydro-geological processes) and sea level rise.

Outlook

- The “Supersites initiative” is presently the main contribution of the Geohazards CoP to the current and next GEO workplan (Task DI-09-01: Vulnerability Mapping and Risk Assessment)

- Focus is on the objectives and benefits of the Supersites, and less on the structure of the governing body and organizational aspects.

- Improvement of the CoP:
  > Involvement of funding agencies (OECD, European Community, National Ministries, USAID, World Bank, Islamic Bank or the Asian Development Bank…);
  > work towards participation of national, regional, and local representatives, and land use planers, who are critical in particular for connections to the exposed populations.
  > Integrate private companies that are end users; for example, insurances, re-insurances, infrastructures operators.