

SUPPORTING RISK MANAGEMENT AND DISASTER
REDUCTION:
THE GEOHAZARDS COMMUNITY OF PRACTICE AND
THE SUPERSITE INITIATIVE

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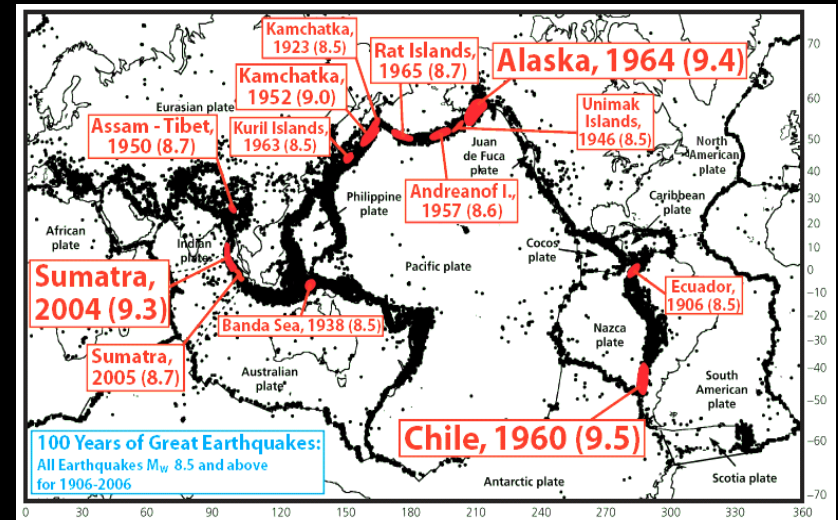
- The Challenge
- Brief History of the GHCP
- Goals, Targets, Activities: The Roadmap
 - Implementation
 - Example Activities



The Challenge

Trends in the last few decades:

Improved understanding of natural hazards, including geohazards, and their causes;



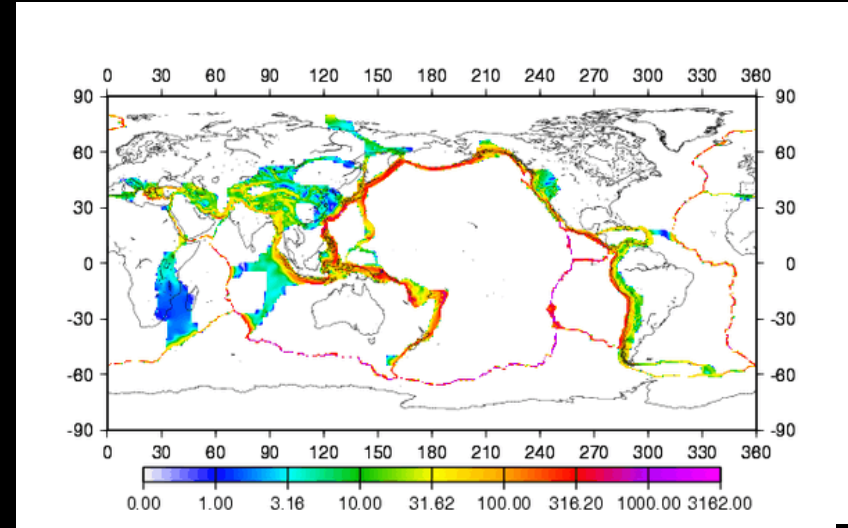
The Challenge

Trends in the last few decades:

Improved understanding of natural hazards, including geohazards, and their causes;

More detailed maps and statistics of hazards and risks;

Increasing resilience in some geographical areas and for some geohazards;



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Increasing resilience in some geographical areas and for some geohazards;

Increasing number and scales of disasters in other areas and for other geohazards.

Why does the improving knowledge not lead to a more significant disaster reduction?



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Why does the improving knowledge not lead to a more significant disaster reduction?



Available information is often not fully exploited for mitigation, adaptation, and preparedness;

Particularly in regions with poverty, information is ignored, and mitigation and preparedness are limited.

The Challenge

International Programs and Actions for Disaster Reduction:

Hyogo Framework for Action 2005-2015:

- building resilience of nations and communities to disasters.

The International Strategy for Disaster Reduction (ISDR):

- generate and support a global disaster risk reduction movement
- reduce risk to disasters through implementation of the Hyogo Framework.

The ISDR priorities for action for 2005 to 2015:

- (1) Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation;
- (2) Identify, assess and monitor disaster risks and enhance early warning;
- (3) Use knowledge, innovation and education to build a culture of safety and resilience at all levels;
- (4) Reduce the underlying risk factors; and
- (5) Strengthen disaster preparedness for effective response at all levels.

The Challenge

Approach to Risk management:

Four phases of the risk management cycle:

- (1) mitigation and preparedness,
- (2) early warning,
- (3) response, and
- (4) recovery

(1) Mitigation and preparedness:

- Knowledge of the hazards, their temporal and spatial characteristics: often not obvious over the span of a human lifetime
- Authorities and administrations need to fully understand the hazards and risks
- Public needs to be aware of the risks and the ...

Building resilience based on fully acknowledgement of the risk

The Challenge

Approach to Risk management:

Four phases of the risk management cycle:

- (1) mitigation and preparedness,
- (2) early warning,
- (3) response, and
- (4) recovery

(2) Early warning:

- Timely and reliable detection of hazards
- means to inform in a timely manner
- knowledge of how to respond to warnings

The Challenge

Approach to Risk management:

Four phases of the risk management cycle:

- (1) mitigation and preparedness,
- (2) early warning,
- (3) response, and
- (4) recovery

(3) Response:

- Rapid assessment of damage
- detection, assessment, and warning of secondary hazards
- supporting response activities

The Challenge

Approach to Risk management:

Four phases of the risk management cycle:

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(4) Recovery:

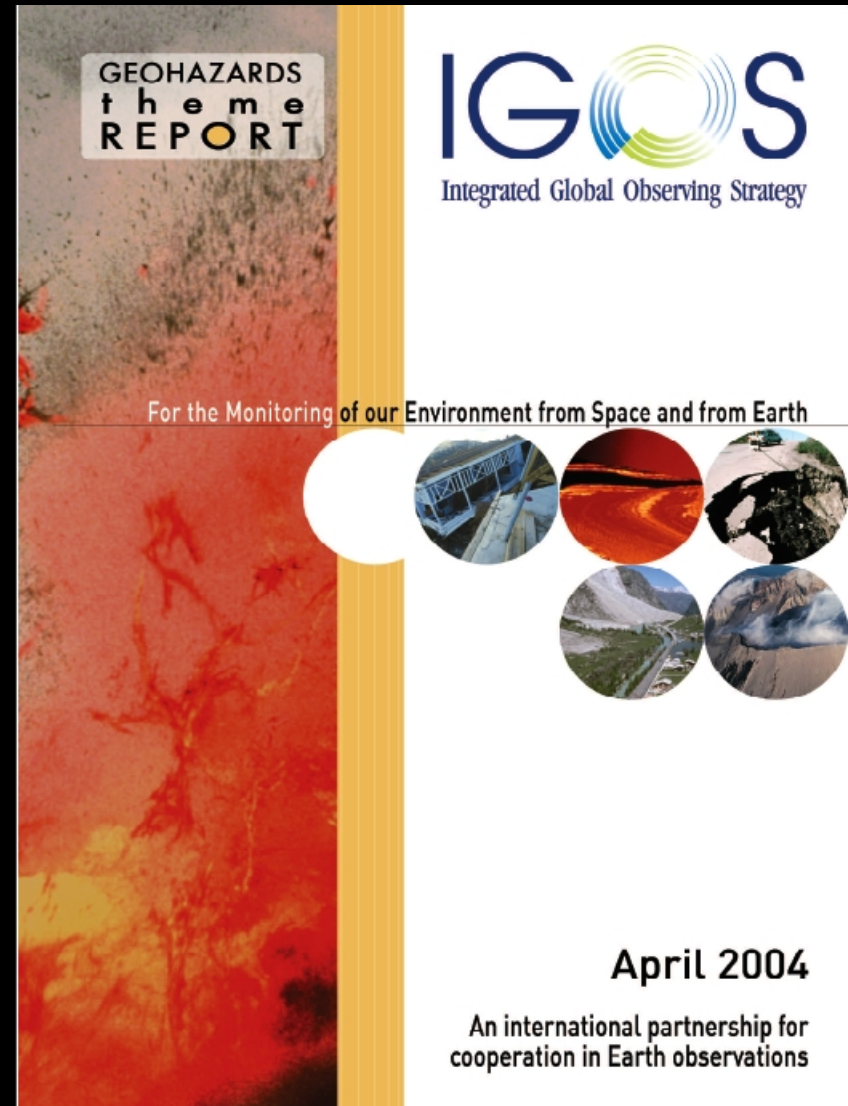
- Learning from the disaster
- Mitigating the impact of future hazards

Brief History of the GHCP

Pre-GEO Activities:

~2000 to 2008: Geohazards Theme of the Integrate Global Observing Strategy Partnership (IGOS-P)

2004: Geohazards Theme Report



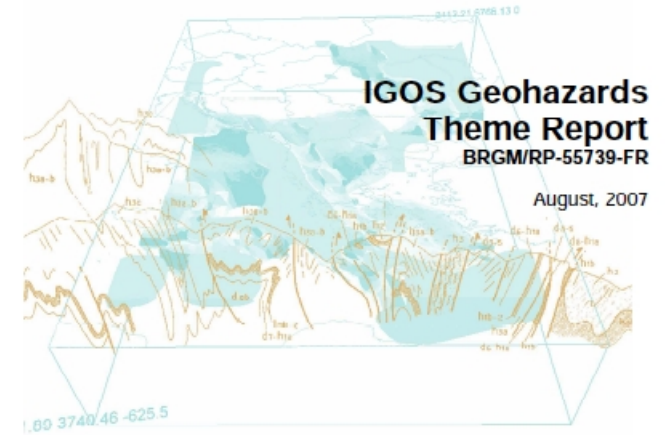
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2007: Geohazards Theme Report update



Brief History of the GHCP

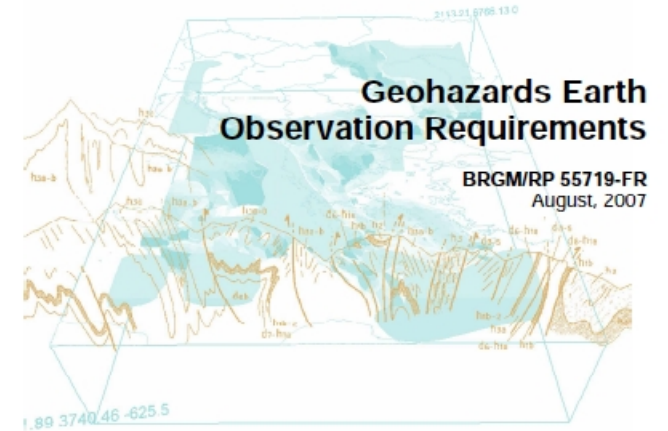
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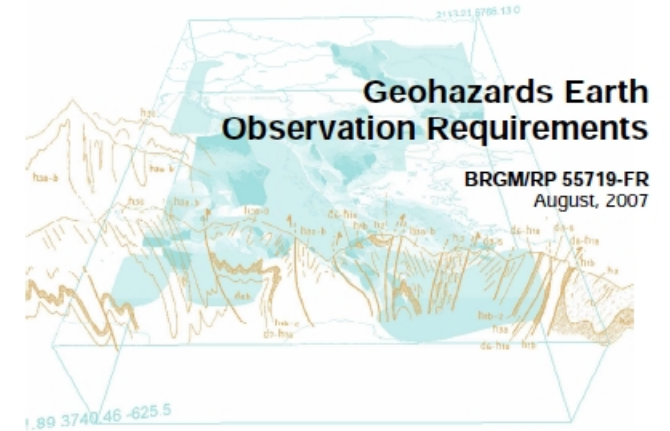
2004: Geohazards Theme Report

2007: Geohazards Theme Report update

2007: Observational requirements

2000 - 2007: Series of three international Workshops on Geohazards

2007: Third International Geohazards Workshop: *Frascati Declaration*



Brief History of the GHCP

3rd International Geohazards Workshop Frascati Declaration 8th November 2007

The third International Geohazards Workshop was held at the European Space Agency, Frascati, from 6th to 9th November 2007. About 250 scientists, engineers, risk managers and decision makers, experts in the field of geohazards, participated to this event. The following declaration was adopted:

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

- the scientific and operational need of both in-situ and space geospatial data, for the forecasting and monitoring of Geohazards
- the need to address this issue within the framework of the Group on Earth Observations(1) and its Geohazards community of practice
- the need to contribute, within our field of expertise/competency to the Hyogo Framework for Action 2005-2015 and its mechanisms for implementation

recommend

- to promote multi-risk approaches for disaster risk management, starting with user requirements gathering, that put emphasis on the mitigation of Geohazards
- 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 facilitate access to geohazards information through development of an architecture of interoperable distributed data and sensors, based on widely recognised interoperability standards and data models
- to stimulate mutual exchange of knowledge between north and south in the field of Geohazards mitigation and to build on capacity
- strengthen relationship between scientific institutions and communities and applied scientists by providing open access to the space and in-situ data
- to strengthen regional coordination efforts building on already existing cooperation mechanisms, initiatives and projects.
- to maintain and build a coordination body to ensure the further development of the Geohazards initiative and Community of Practice

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- the need to contribute, within our field of expertise/competency to the Hyogo Framework for Action 2005-2015 and its mechanisms for implementation

recommend

- to promote **multi-risk approach for disaster management** gathering, that put
- to establish **set of reference sites with open data access and end-to-end approach** various partners and end-users
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- to stimulate mutual exchange of knowledge between north and south in the field of Geohazards mitigation and to build on capacity
- strengthen relationship between scientific institutions and communities and applied scientists by providing open access to the space and in-situ data
- to strengthen regional coordination efforts building on already existing cooperation mechanisms, initiatives and projects.
- to maintain **Community of Practice** Geohazards initiative and Comm

Brief History of the GHCP

Transition into GEO and Development of the GHCP:

2006: IGOS-P and GEO start discussion of transition

2008: IGOS-P is dissolved after successful transition

2008: First Geohazards CoP Web Page established by BRGM.

GEO Community of Practice - SeaMonkey

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

brgm Geoscience for a sustainable Earth esa GEO GEO GEOHAZARDS COMMUNITY OF PRACTICE igos GEOHAZARDS

Geohazards Initiative

- GEO Community of Practice
- Supersites
- 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)

The diagram illustrates the Geohazards Communities of Practice (CoP) structure. At the center is the **Geohazards Community of Practice**. Surrounding it are several specialized CoPs, each with associated stakeholders:

- Earthquakes CoP**: FDSN, Geological surveys, seismologists
- Structure engineers**: Building companies, geological surveys, science organisations
- Risk managers**: Local national, european authorities, civil securities, geological surveys
- Insurance and re-insurance companies**
- Geophysics CoP**: Geological surveys, GGOS, WOVO, FDSN, ICL, geophysicists
- Coastal risks CoP**: Science organisations, Geological surveys
- Space Agencies**
- Landelides CoP**: ICL, Geological surveys
- Volcano CoP**: WOVO, Geological surveys, volcanologists

Arrows indicate the flow of **Information** (top) and **Data** (bottom) between the central CoP and the surrounding specialized CoPs.

While IGOS objective was to define a strategy, GEO is in charge of the implementation of GEOSS. To implement GEOSS, GEO defines tasks that are entrusted by Members, States or organisations, or even expert groups. Each task regards to a specific committee.

Brief History of the GHCP

Transition into GEO and Development of the GHCP:

2006: IGOS-P and GEO start discussion of transition

2008: IGOS-P is dissolved after successful transition

2008: First Geohazards CoP Web Page established by BRGM.

2008: Supersite Initiative included in GEO Task DI-09-02c and Geohazards CoP included in several Task Teams

December 2008: Geohazards Bureau at BRGM closed after three years of ESA funding

GEO Community of Practice - SeaMonkey

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

esa GEO igos GEOHAZARDS COMMUNITY OF PRACTICE

GEO Community of Practice

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- Insurance and re-insurance compagnies**

Arrows indicate the flow of **Information** and **Data** between these groups and the central CoP.

Contact
Home

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in GEO Task D
Geohazards Co
several Task T

December 2008
Bureau at BRG
years of ESA f

2009: Supersite Web Page
established by UNAVCO

The screenshot shows the 'Supersites - SeaMonkey' browser window. The address bar contains 'http://supersites.unavco.org/main.php'. The page features a navigation menu on the left with links for 'main', 'documents', 'apply for access', 'collaborators', 'links', and 'contact'. The main content area includes the 'GEO GROUP ON EARTH OBSERVATIONS' logo, a 'Welcome to the Supersite Website' heading, and introductory text about the data provided. Logos for 'esa', 'NASA', and 'NSF' are displayed on the right. At the bottom, the 'UNAVCO' logo is prominent. A world map is shown with several orange stars indicating 'PHASE 1' supersites. A sidebar on the left lists specific supersites: 'Hawaii', 'vesuvius', 'Etna', 'Istanbul', and 'Tokyo'.

Brief History of the GHCP

Recent Activities of the Geohazards CoP (GHCP):

July - December 2009: Meetings of core group

Brief History of the GHCP

Recent Activities of the Geohazards CoP (GHCP):

July - Dec
core group

The screenshot shows the website for the Geohazards Community of Practice (GHCP) under the Group on Earth Observations (GEO). The browser window title is "Geohazards Community of Practice of GEO - SeaMonkey". The page header includes the GEO logo and the text "GROUP ON EARTH OBSERVATIONS". The main heading is "The GeoHazards Community of Practice (GHCP)". A navigation menu contains links for "Projects", "Products", "Library", "Meetings", "Workshops", and "Internal".

On the left sidebar, there are several news items:

- Increasing resilience:**
 - Disaster roundtable of NAS
- Eyjafjallajökull Eruption:**
 - Wiki on Ash Cloud
- Northern Mexico (Baja) earthquake 2010:**
 - NYT: *In California, Louder Calls to Prepare for Quakes*
 - USGS Page
 - Baja SuperSite
- Chile earthquake 2010:**
 - GEO News Item
 - Chile SuperSite
 - Wikipedia overview ...
- Haiti earthquake 2010:**
 - GEO News Item
 - Haiti SuperSite
 - Satellite Images and Damage assessment
 - Bye, B L.: *The Haiti Earthquake: Science, Early Warning And Mitigation*

The main content area features a photograph of a damaged building and a section titled "Geohazards: A challenge to Society". The text in this section discusses the impact of geohazards on society and the role of the GHCP in addressing these challenges. It mentions the importance of observing and understanding geohazards to support risk assessment and hazard mitigation. The text also highlights the role of the GHCP in building a successful Global Earth Observation System of Systems (GEOSS) and providing support to the nine Societal Benefit Areas (SBAs).

Another section titled "The Geohazards Community of Practice for GEO" provides an overview of the GHCP's activities and goals. It states that the GHCP was established to make progress towards the GEO's goal of providing timely information on geohazards. The text describes the GHCP's work in supporting the GEO's efforts to reduce the risk of geohazards through various initiatives, including the Super Sites and the Global Datasets Task. It also mentions the GHCP's role in organizing the 1st Workshop on January 18-21, 2010 in Paris.

A section titled "Our Strategic Target" outlines the GHCP's vision for 2020. It states that the GHCP aims to put in place all building blocks for comprehensive monitoring of geohazards and the provision of timely information on spatio-temporal characteristics, risks, and occurrence of geohazards. The text also mentions the GHCP's goal of supporting the GEO's efforts to reduce the risk of geohazards through various initiatives, including the Super Sites and the Global Datasets Task.

December 2009: GHCP Web Page at
<http://www.geohazcop.org>

Brief History of the GHCP

Recent Activities of the Geohazards CoP (GHCP):

July - Dec
core group

December
http://www

January 18-21, 2010: 1st GHCP
Workshop, UNESCO, Paris:
Drafting of the GHCP Roadmap

The screenshot shows a web browser window titled "Geohazards Community of Practice of GEO - SeaMonkey". The page header includes the GEO logo (GROUP ON EARTH OBSERVATIONS) and the title "The GeoHazards Community of Practice (GHCP)". A navigation menu contains links for Introduction, About GHCP, GHCP and GEO, News, Projects, Products, Library, Meetings, Workshops, and Internal. A sidebar on the left lists "Program Overview", "Detailed Program", "Outputs" (Workshop Report: pdf, html; Roadmap Presentation: ppt, pdf), "Work Area" (Draft Final Roadmap V0.5: doc, pdf; Comments on Roadmap; Comment Submission), "Invitation" (Invitation Letter), and "Relevant Documents" (GEOSS Work Plan Site; Task Sheets; Frascati Declaration). The main content area is titled "Building a Geohazards Community of Practice in GEO Work Plan Tasks and GEOSS Implementation" and "of the Geohazards Community of Practice of GEO, 18-21, 2010, Paris, France". It features logos for UNESCO, GEO, and IGOS. The text describes the workshop's rationale, goals, participation, and sessions.

Building a Geohazards Community of Practice in GEO Work Plan Tasks and GEOSS Implementation

of the Geohazards Community of Practice of GEO, 18-21, 2010, Paris, France

Workshop Rationale: Communities of Practice (CoPs) are a key element for the linkage of GEO to users of products and services provided by GEOSS. In many geographical areas, geohazards are a major threat to society. Understanding and comprehensive knowledge of these hazards is pivotal for adaptation, reduction of vulnerability, and preparedness. The Geohazards Community of Practice (GHCP) is therefore highly relevant for several of the nine Societal Benefit Areas (SBAs) addressed by GEO. Over the last few years, initial steps have been taken by the IGOS-P Geohazards Theme Team to make progress towards a GHCP for GEO. In order to support this progress, a comprehensive review of the current situation and the development of perspectives and strategies for the next five years appears timely.

Workshop Goals: The Workshop aimed at developing a roadmap for the GHCP that would lead to active support of GEO and GEOSS components in a wide range of geohazards-related issues. A number of Tasks in the GEO Work Plan 2009-2011 are to be supported by the GHCP (see "GHCP and GEO" for more details on the Tasks), and the Workshop aimed to focus the roadmap to provide community support for these Tasks.

Participation: Participation in this first Workshop was by invitation. In total, 21 representatives of Participating Organization in GEO, the GEO Secretariat, and international organizations took part in the workshop.

Sessions:

- Session 1: Geohazards in the GEO and GEOSS Framework
- Session 2: Contributions of the GHCP to GEO (Breakout Sessions)
 - Breakout Session 2a: The GHCP and the GEO Work Plan, the GEO Task Teams, and the GEO Committees
 - Breakout Session 2b: Science, Technology, and Infrastructure issues in relevant GEO Work Plan Tasks
- Session 3: Perspectives of the GHCP (Breakout Sessions)

A Roadmap for the Geohazards Community of Practice of the Group on Earth Observations

Starting Point:

GEOSS STRATEGIC TARGET OF THE DISASTER SBA:

Enable the global coordination of observing and information systems to support all phases of the risk management cycle associated with hazards (mitigation and preparedness, early warning, response, and recovery).

This will be achieved through:

- more timely dissemination of information from globally-coordinated systems for monitoring, predicting, risk assessment, early warning, mitigating, and responding to hazards at local, national, regional, and global levels;
- development of multi-hazard and/or end-to-end approaches, as appropriate to meet the needs for disaster risk reduction, preparedness and response in relevant hazard environments;
- supporting the implementation of the priorities for action identified in the Hyogo Framework for Action 2005-2015: Building the resilience of nations and communities to disasters (HFA).

A Roadmap for the Geohazards Community of Practice of the Group on Earth Observations

Strategic Target of the GHCP:

By 2020 put in place all building blocks for comprehensive monitoring of geohazards and the provision of timely information on spatio-temporal characteristics, risks, and occurrence of geohazards, in support of all phases of the risk management cycle (mitigation and preparedness, early warning, response, and recovery), and as a basis for increased resilience and disaster reduction.

This will be achieved through:

by developing a global network of very few carefully selected core sites. These core sites will provide focal points for a large geographical region, where all building blocks of a value chain from observations to end users can be linked together and applied to the phases of the risk management cycle relevant for this region. Thus, these core sites will demonstrate the concept, enable scientific studies and technological developments, provide for capacity building, and inform policy and decision making in the region.

A Roadmap for the Geohazards Community of Practice of the Group on Earth Observations

Contents:

Preamble (GHCP, membership and responsibilities, the Roadmap goals, audience, scope remains geohazards, but GHCP can be used as a pilot for other hazards in the Disasters SBA, describe links to other hazards, making the point that the roadmap structure is generic...)

Origin of the Roadmap (Workshop, iteration, ...)

Introduction

- Natural Disasters.
- Why focus on Geohazards?
- Where do we want to go? (the goals).
- Where do we stand?
- What is needed in order to get from here to there?

The Way Forward (The Map)

Goals, Targets, and Activities: The GHCP Roadmap

A Roadmap for the Geohazards Community of Practice of the Group on Earth Observations

Contents:

- The Map based on the four phases of the risk management cycle:

The Way Forward (The Map)

Activity 1: Mitigation and preparedness

Activity 2: Early warning

Activity 3: Response

Activity 4: Recovery

Several cross-cutting issues identified, including the need to integrate geohazards information related to all four phases into the publicly available environmental information (like weather forecasts, air quality, hurricane forecasts, ...)

Implementation of the GHCP Roadmap

Pilot Implementation:

- End-to-end pilots on a global network of a few “Regional Pillars” (core sites);
- At least on core site per continent.

Goals for the core sites:

- comprehensive monitoring and free access to all data;
- end-to-end approach and all phases of the risk management cycle;
- "tandem" sites with partnership between core sites in developed and developing regions;
- build (a few) strong regional centers of excellence (capacity building and capacity retention);
- provide a testbed for capacity building in the region (monitoring, processing, science, application ...);
- should be determined through a Call for Proposals to all GEO Member Countries for the regional core sites through GEO.

Target: Call for Core Sites in 2010

Implementation of the GHCP Roadmap

Goals for the development of the GHCP:

Extent the networking of the global community, i.e. the GHCP.

Core funding for the GHCP:

- COST Action: global coordination around nucleus in Europe;
- Preproposal due in Septemeber.

Regional Offices:

- Should take the lead in organizing the regional core sites;
- Should provide support for regional CoPs;
- Should maintain a link to the global GHCP.

Example Activities

Supersite Initiative

Comprehensive data access for a small set of supersites representing different geohazards

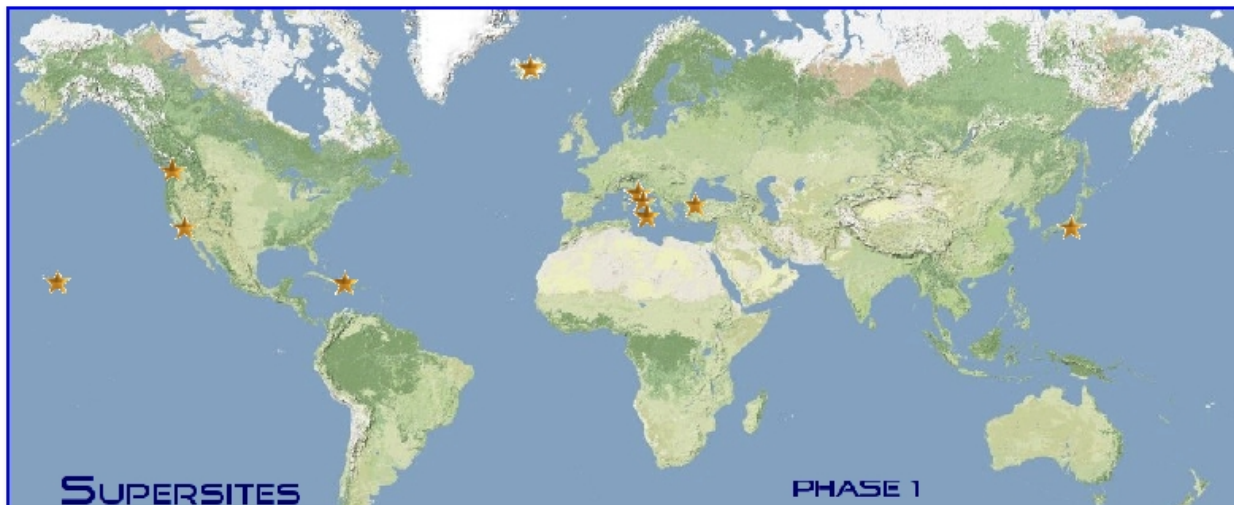


Welcome to the Supersite Website

The Supersites have data for the study of natural hazards in geologically active regions, including information from Synthetic Aperture Radar (SAR), GPS crustal deformation measurements, and earthquakes. The data are provided in the spirit of GEO, ESA, NASA and the National Science Foundation (NSF), that easy access to Earth science data will promote their use and advance scientific research, ultimately leading to reduced loss of life from natural hazards.

Click on a site in the map below, or see the regions listed below in Phase 1 and Phase 2 Supersites.

This website is a prototype created by [UNAVCO](#) and [Winsak](#) on behalf of the Group on Earth Observations ([GEO](#)) and the European Space Agency ([ESA](#)). The web site will attain an official design and move to a permanent home once a host is selected.



main

documents

apply for
access

collaborators

links

contact

Hawaii

Los Angeles

Seattle-Vancouver

Vesuvius

Etna

Istanbul

Tokyo

Example Activities

Supersite Initiative

Comprehensive data access for a small set of supersites representing different geohazards

Supersites added for recent disasters

WELCOME TO GEO'S HAITI EVENT SUPERSITE WEBSITE

GROUP ON EARTH OBSERVATIONS

Sections
[SAR](#), [Topography](#), [Visible](#), [GPS](#), [Surface Deformation](#), [Earthquakes](#), [Links](#)

New on Wednesday Feb 24: [PALSAR uplift map](#)
New on Monday Feb 22: [Relief Resources from the OGC](#)
New on Thursday Feb 18: [ScanSAR interferogram](#)
New on Thursday Feb 11: [Radarsat interferogram](#) [Liquitaction](#)
New on Tuesday Feb 9: [COSMO-SkyMed interferograms](#)
New on Thursday Feb 4: [UAVSAR full resolution files](#)
New on Tuesday Feb 2: [UAVSAR false color image](#) [PEER engineering report](#)
New on Monday Feb 1: [PALSAR interferogram with fault](#) [Fault coordinates](#)
New on Friday Jan 29: [Stress Triggering](#) [PALSAR interferogram](#) [Two new ALOS orbits](#)
New on Thursday Jan 28: [link to USGS open file report](#) [ASAR wide swath interferogram](#)
New on Wednesday Jan 27: [updated DLR TerraSAR-X report](#) [new ALOS interferogram by Jaxa](#)
New on Tuesday Jan 26: [TerraSAR-X interferogram](#) [Postseismic relaxation model](#) [ALOS data](#)
New on Monday Jan 25: [Spot 5 displacement map](#) [TerraSAR-X displacement map](#)

Earthquake, 12 January 2010 21:53:10 UTC, lat 18.457 N, lon 72.533 W, Mw 7.0, Depth 13 km (USGS)

If you have data or results that you would like to post on this webpage, please e-mail Falk Amelung, the Task Leader of GEO's Supersite initiative (famelung@rsmas.miami.edu) or Susanna Gross (sjg@unavco.org). Please include a kmz file as they are convenient to use in the field.

USGS ShakeMap : HAITI REGION
Tue Jan 12, 2010 21:53:09 GMT M 7.0 N10.45 W72.45 Depth: 10.0km ID:2010j10

Example Activities

Supersite Initiative

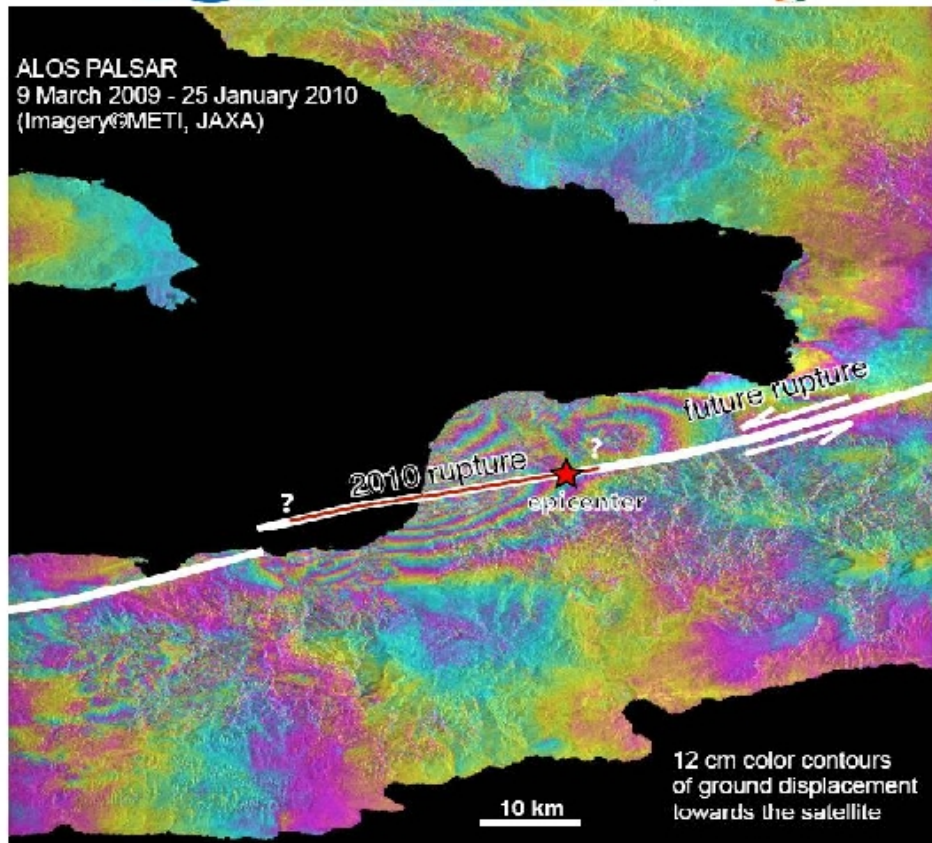
Comprehensive data access for a small set of supersites representing different geohazards

Supersites added for recent disasters

Serving in particular science communities



Falk Amelung's group at the University of Miami has made a new PALSAR interferogram:



Sang-Hoon Hong, Falk Amelung, Tim Dixon, Shimon Wdowinski, Guoqing Lin, Fernando Greene
Rosenstiel School of Marine & Atmospheric Science, University of Miami

The rupture length shown above has been inferred by preliminary modelling. We expect to obtain better constraints on the rupture length from the ascending interferogram expected for February 14.

Eric Fielding of JPL has made a new PALSAR interferogram:

Example Activities

Supersite Initiative

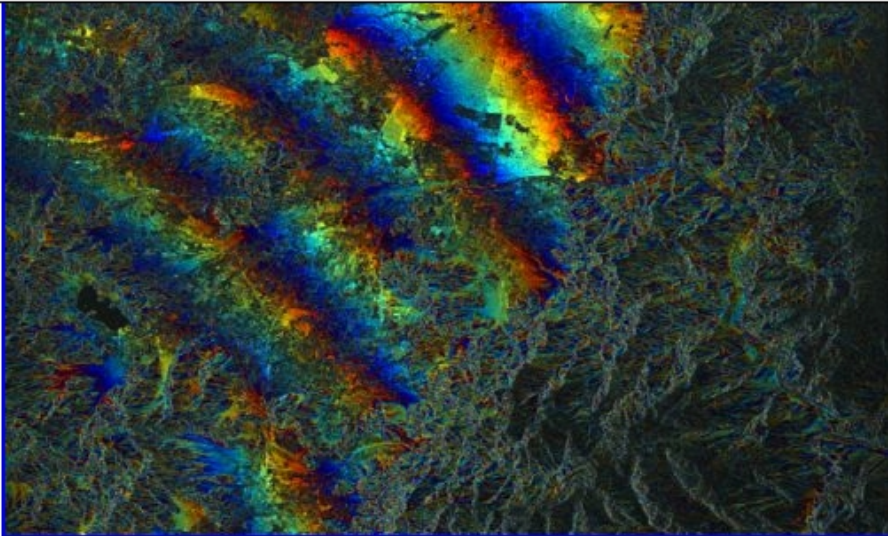
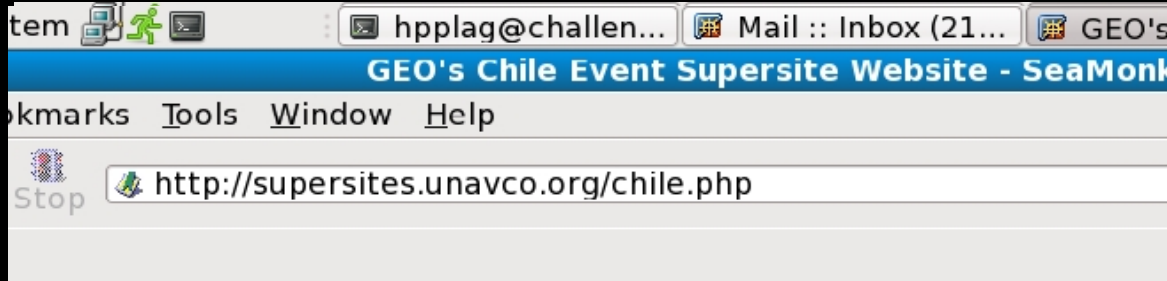
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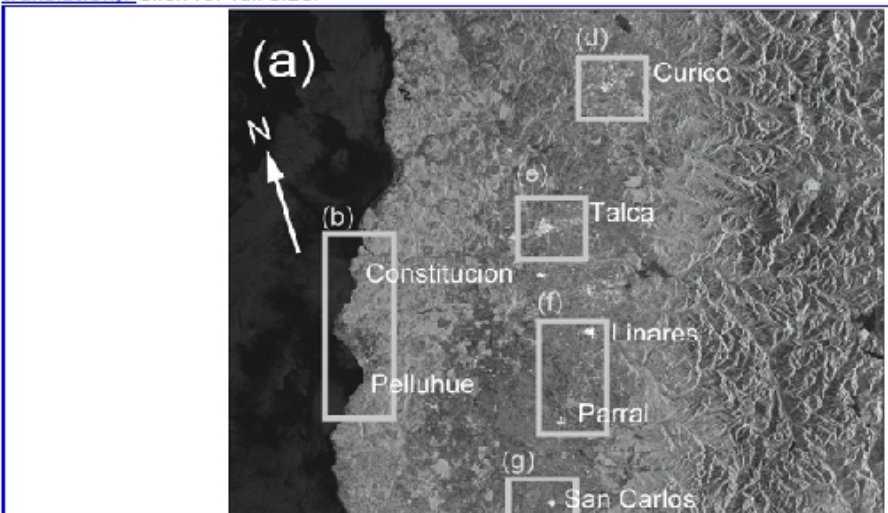
Serving in particular science communities

Pool for new approaches and products

Clearinghouse for disasters?



A map of estimated building damage from Masashi Matsuoka of Japan's AIST using PALSAR images. for more information, see [their report \(in Japanese with English translation\)](#). Click for full size.



Example Activities

Start core sites around pilot projects:
Low latency surface displacements for hazard mapping, monitoring, and early warning as well as other societal applications

Initial consideration of tandem-locations:

- Southwest U.S. and Caribbean
- Europe and East Africa
- Japan and ???

Pilot Project: Low-latency surface displacement

Thank You!

If you would like to contribute to the activities of the GHCP, please, contact Stuart Marsh (shm@bgs.ac.uk) or Hans-Peter Plag (hpplag@unr.edu).