GROUP ON EARTH OBSERVATIONS

Disasters SBA: Geohazard CoP, DI-09-01 & Di-09-02

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The GeoHazards Community of Practice (GHCP)

Geohazards Community of Practice of GEO - SeaMonkey

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The GeoHazards Community of Practice (GHCP)

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Introduction

Geohazards CoP at BRGM

Latest News:
***Geohazards Workshop was held in Paris*: A** Geohazards Workshop took place on January 18-21, 2010 in Paris. Main goal of the workshop was to scope out the objectives, goals, membership, and work programme of the GEO Geohazards Community of Practice. A roadmap for the GHCP was drafted and this roadmap is now being discussed and finalized in the GHCP and wider GEO community. The Workshop Web Page is available at the GHCP's workshop web page.

Some links relevant to the Haiti earthquake:
- GEO News Item
- Haiti SuperSite
- Satellite Images and

Chile Earthquake 2010 ...

Geohazards: A challenge to Society

In many regions, geohazards are a major threat to society, costing lives, disrupting infrastructure and destroying livelihoods. Understanding the associated processes and gaining a comprehensive knowledge of the location and behaviour of these hazards is pivotal for risk assessment, hazard mitigation and adaptation, reduction of vulnerability and preparedness. The importance of observing and understanding geohazards to the GEO Disasters Societal Benefit Area (SBA), in particular, in building a successful Global Earth Observation System of Systems (GEOSS) is clear. Communities of Practice

A Geohazards Community of Practice for GEO

Over the past few years, initial steps have been taken by members of the former IGOS Geohazards Theme Team to make progress towards a Geohazards Community of Practice (GHCP) for GEO. This has been seen in successful initiatives like Super Sites and through a number of GEO Tasks, in the Disasters SBA, in other SBAs and in cross-cutting tasks like the Global Datasets Task. In order to support and build on this progress, a comprehensive review of the current situation and the development of strategies for the next five years is timely. Therefore, together with GEO and UNESCO, the GHCP organized its 1st Workshop on January 18-21, 2010 in Paris (see Workshop Page ...). This Workshop was of interest to the entire GEO and wider geohazards community; space agencies, geological surveys, end users such as civil protection agencies, the key observing systems (geodetic, seismic, magnetic) and the international networks for the major hazards addressed by the

Our Strategic Target

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
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.

Done

Dedicated website is at www.geohazcop.org

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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).

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 by:

- developing a global network of very few carefully selected **core sites**
- addressing to **all the relevant phases of the risk management cycle**

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)

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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 RoadMap has 4 Activities

Activity 1: Mitigation and preparedness

Identifying Stakeholders – Understanding Geohazards & Mitigation – Informing Policy & Decision Makers & Society – Creating Awareness

Activity 2: Early warning

Improving models, Forecasts & Predictions – Monitoring & Detection – Informing Warning Systems – Integration in Public Information Systems

Activity 3: Response

Characterising event – Assessing Disaster – International Clearinghouse

Activity 4: Recovery

Informing the Recovery Phase

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

The following cross-cutting issues affect all four Activities:

- Observation system/sensors/ information system development
- Capacity Building (CBC) and Outreach (all GEO Committees?)
- Science advances, inc. promotion of evidence based policy-making
- Reaching/connecting scientists/research and/to end-users/operations
- Resources – human and financial, for the network and its activities
- IPR and data access issues
- EO–In-situ integration and ground truthing
- Resilience – before, during and after
- Interface with mandated advisory bodies/existing chains of command
- Awareness

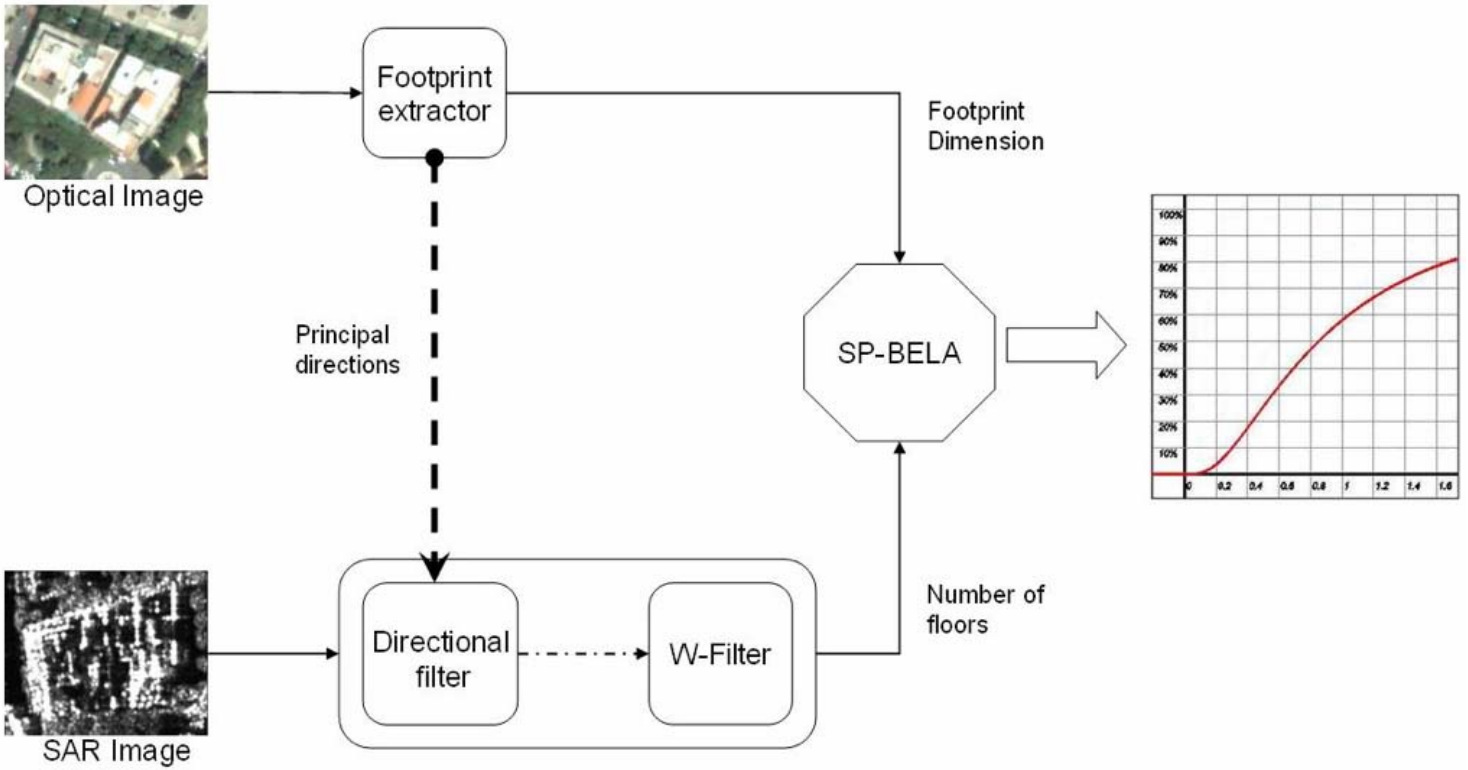
DI-09-01: Systematic Monitoring for Geohazards Risk Assessment
Define and implement a unified and integrated approach to geohazards risk assessment. Build upon synergies and integrate data from global in-situ seismographic networks and remote sensing. Coordinate multi-level efforts and implement decision-support tools to facilitate and support data access for selected “Supersites” locations.

a) Vulnerability Mapping and Risk Assessment
Italy/EUCENTRE, fabio.dellacqua@eucentre.it

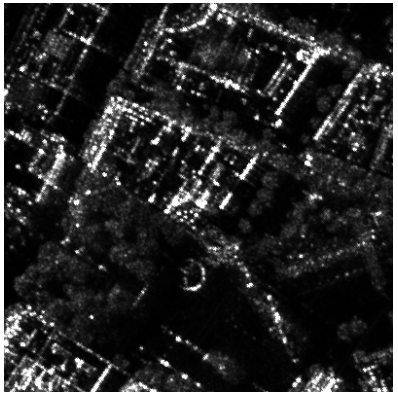
Includes the Supersites Initiative
ESA/UNAVCO/WinSAR/GFZ/FDSN and others

b) Seismographic Networks Improvement and Coordination
USA/USGS, choy@usgs.gov

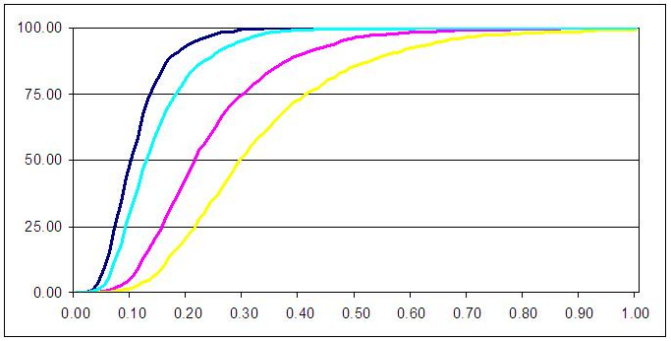
DI-09-01: The processing chain



Case study: Messina (Italy)



optical image & radar image of building



vulnerability curves

- Fairly complete dataset, including satellite optical and airborne radar
- We have proposed Messina as a possible supersite (ISPRA is willing to contribute relevant data)

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Issues

- Some parameters relevant to vulnerability estimation:
  - either can not be extracted from remotely sensed data at all, or
  - they can, but only by relying on weak correlations
- limited availability of VHR radar data
- integration of:
  - proximity sensing
  - “community remote sensing” (i.e. the voluntary contribution of information under various forms)
- Ground truth to assess quality and reliability of results
- Ideas for funding a currently underfunded activity...?

Supersites Initiative

Frascati Declaration in November 2007 included recommendation to "stimulate international and intergovernmental effort to monitor and study selected reference [geologic hazard] sites, by establishing open access to relevant datasets according to GEO principles, to foster collaboration between various partners and end-users"

Geohazard Supersites Special Topics Session
Unavco Science Workshop, Boulder, Co, March 9 2010
Summarized by F. Amelung, University of Miami

Proposed permanent structure of Supersites

- Website: hosted by GEO
- Organizer: GFZ/EPOS (Joern Lauterjung)
- SAR: coordination by advisory committee (ESA, GEO, WinSAR, Unavco)
- GPS: Unavco/EPOS/other?
- Seismic: International Federation of Digital Seismic Networks (FDSN)

Milestones/Timeline

- April 2010: Discussions at EGU/EPOS meeting
- June 28 2010: ESA's meeting in Bergen, Norway
- October 2010: GEO ministerial summit in Beijing

Supersites Website

Applications Places System | hpplag@challe... | Supersites - S... | [https://10.10... | Thu Mar 25, 12:15 AM

Supersites - SeaMonkey

SUPERSITES

main

documents

apply for access

collaborators

links

contact

Hawaii

Los Angeles

Seattle-Vancouver

Vesuvius

Etna

Istanbul

Tokyo

Chile

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esa

NASA

NSF

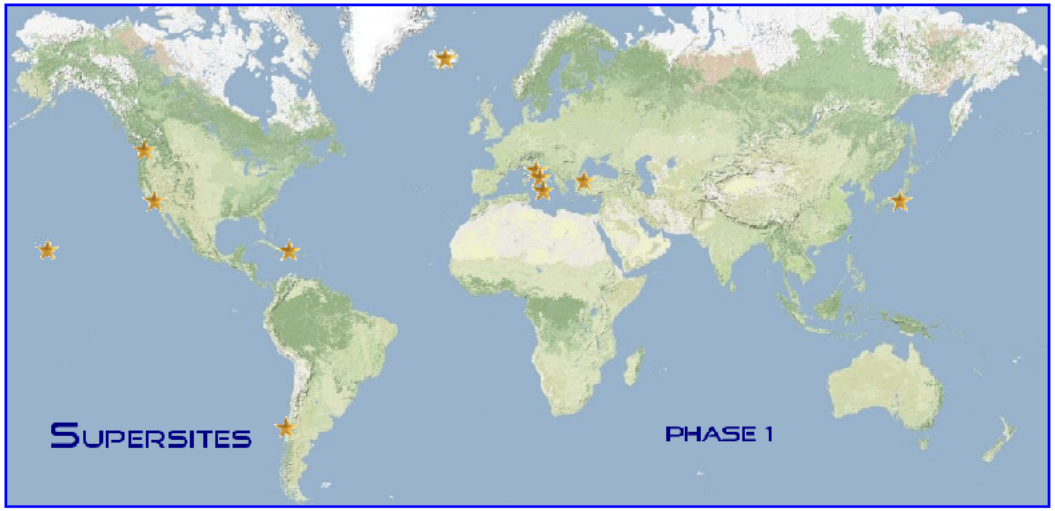
UNAVCO

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 WInSAR 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.



Done

Supersites Chile Response

Proposed Showcase

Rationale: Supersites can be positioned as crisis-driven. It lends itself to colorful, meaningful imagery. Message: GEO is flexible and can adapt rapidly to events…

Proposed Recommendations for Ministerial Summit as at March 2010

• Create Wenchuan earthquake Supersite with multi-satellite SAR, GPS, Seismics
• Develop Earthquake Supersites for all large earthquakes (M>7 or >1M affected)
• Volcano Supersites for volcanic crises (initial SAR, Seismic/GPS 6 month delay)

Questions: GEO Geohazard Community of Practice

• How sensible/sustainable is it to create a Supersite every time there is a disaster?
• Are sites just providing data for research, or should they support the end-to-end, multihazard approach that is advocated by the CoP?

Questions: GEO Science & Technology Committee Disasters SBA Review

• How well is the Supersites initiative linked in to the Disasters Task it is part of?
• What is the relationship of the Supersites web infrastructure to the GCI?

Recommendation from GEO Science & Technology Committee, March 2010

➢ Broaden the Showcase to cover other activities and address the above questions

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DI-09-01b Seismographic Networks Improvement and Coordination

Improvement of capabilities for global seismographic networks...

... such as GSN, FDSN (including regional and global components), GNSS networks and new ocean bottom networks such as VENUS, NEPTUNE and ESONET

Facilitate sharing of data and event products among GEO members. Expand and coordinate efforts to provide access, using GEOSS interoperability methods, to real time and archived seismological data and products. Develop a portal that will interlink distributed seismological data centers and provide seamless access to other GEOSS components. Broaden the scope of this activity to identify and build upon synergies across in-situ observing network types (e.g. seismological, GNSS, hydrological).

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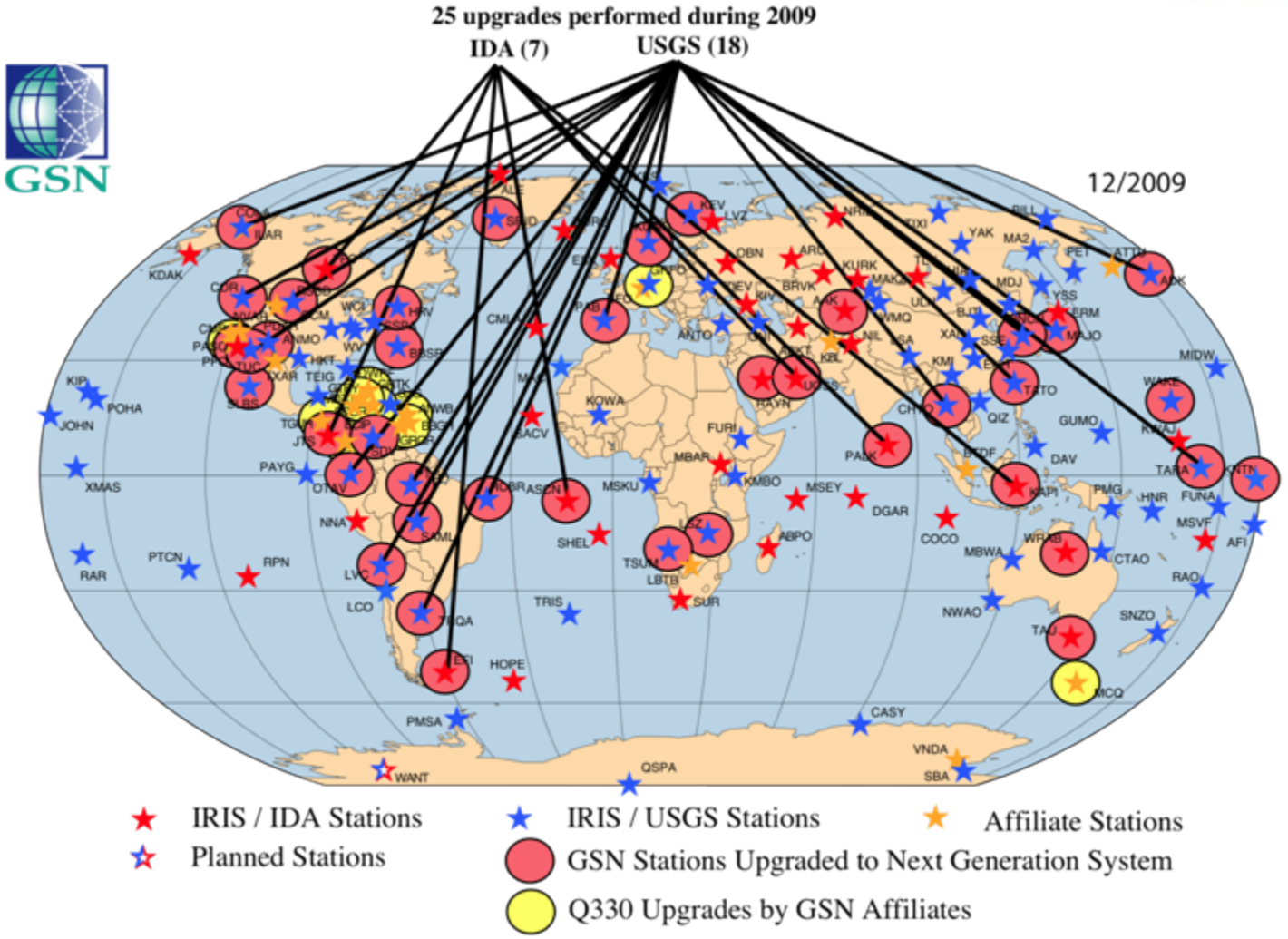
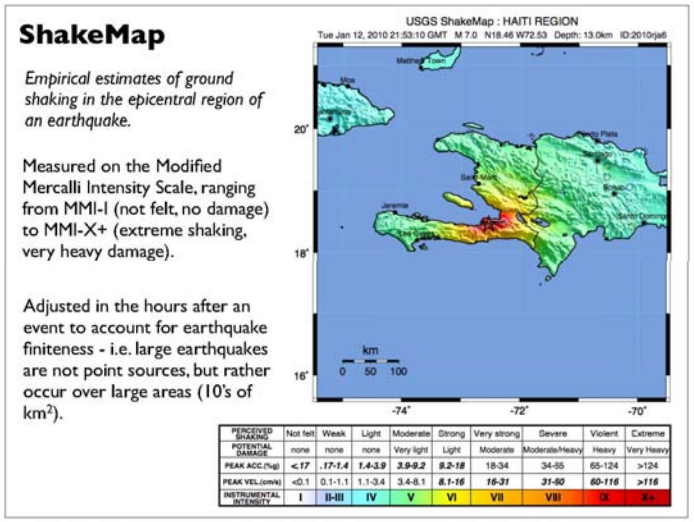
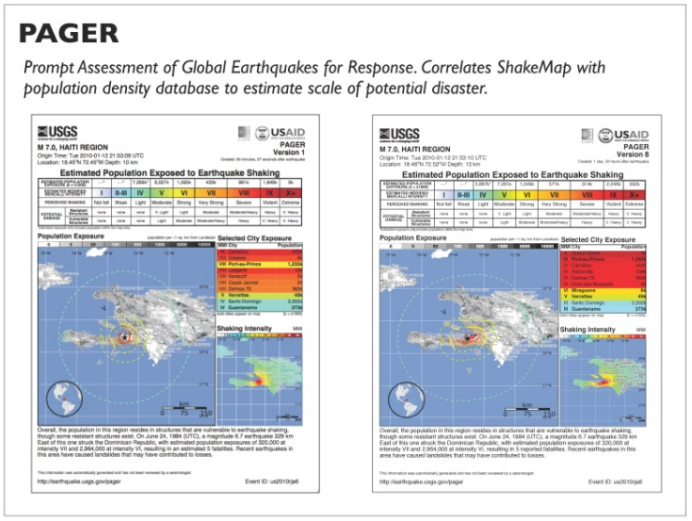


Ongoing Issues

- Continue to develop tools to utilize data in near real-time to expedite disaster relief
- Translate understanding of the physical mechanisms of disasters into useful measures for disaster mitigation (e.g. building codes or warning systems)
- In other words, the issue is integration of this excellent activity into Roadmap





Acknowledgment: slide contributors include G. Hayes (USGS), R. Butler (IRIS), EMSC, Haiti Supersite

DI-09-02: Multi-Risk Management and Regional Applications
Define and implement an integrated approach to all phases of disaster management. Develop a framework for regional disaster management applications.

a) Implementation of a Multi-Risk Management Approach
WMO, mgolnaraghi@wmo.int

This Sub-Task appears to be inactive. GHCP is re-activating it

b) Regional End-to-End Disaster Management Applications
CEOS/CSA, guy.seguin@asc-csa.gc.ca

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DI-09-02B
Regional End-to-End Demonstrations

Guy Seguin (CEOS Disaster SBA Team Chair, DI-09-02B Lead and PoC)

Sub-projects
Namibian Flood and Health Pilot – Lead: NASA
Caribbean Satellite Disaster Pilot – Lead: NASA

- Demonstrate effectiveness of satellite imagery to strengthen capacity for mitigation, management and coordinated response to natural hazards
- Identify specific satellite-based products that can be used for disaster mitigation and response on a regional level
- Identify capacity building activities that will increase ability of region to integrate satellite-based information into disaster management

CDEMA The Caribbean Disaster Emergency Management Agency
CATHALAC
CEOS
CSA ASC
GEO GROUP ON EARTH OBSERVATIONS
NASA
UNITED NATIONS Office for Outer Space Affairs
NOAA
esa

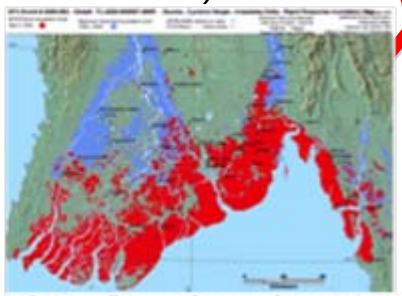
"Sensor Web"

Real-time Satellite Situational Awareness

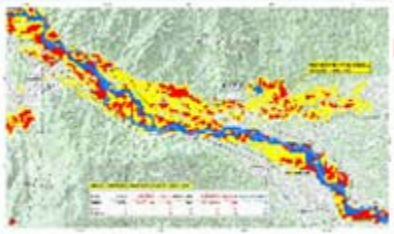
1. Global and regional flood prediction models detect risk
(DEMs + TRMM, MODIS)

2. Automated broad area satellite data acquisitions as event unfolds

Daily Flood Map
(MODIS 250m)



2-3 day Radar Flood Map
(100m RSAT, Envisat, with MODIS Global Flood Mask)



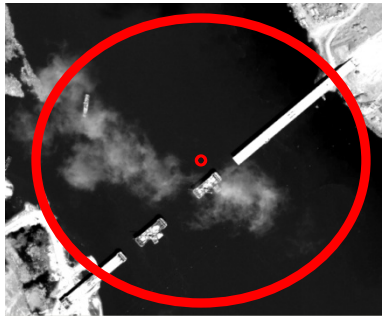
3. Targeted high-res image acquisitions during/after event for most affected areas
(optical or hi-res SAR)

30m

2.5m

10m

.61m



4. Integrated information managed with multi-sensor campaign manager

mitigation | warning | response | response | response | recovery

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Project Milestones (CSDP)

- **February 2009:** creation of CSDP Steering Committee – regular program planning teleconferences
- **July 2009:** selection of national partners and establishment of national teams
- **July and August 2009:** national partner kick-off meetings
- **October 2009:** initial review meeting to develop project list
- **December 2009:** development of 2010 workplan and project milestones
- **May 2010:** project team interim reports submitted to steering committee
- **June 2010:** mid-term review of Phase I projects
- **December 2010:** Hurricane Season report and design review for Phase I projects
- **February 2011:** presentations to donor agencies
- **March 2011:** Phase I report and recommendations for next steps
- **June 2011:** Phase II kick-off

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Partnership Commitments

- Phase 1 National Partners: Barbados, Virgin Islands, Grenada, Jamaica, Saint-Lucia (in-kind resources and national data sets)
- Other local users: Caribbean Disaster and Emergency Management Agency, Caribbean Institute for Meteorology and Hydrology; *other Caribbean and Central American countries invited to join in project teams*
- Satellite Data providers: ASI (Italian Space Agency), CSA (Canadian Space Agency), ESA (European Space Agency), NASA, USGS, DLR, and NSPO/Taiwan, others still joining...
- Value-added and related contributions: CATHALAC/SERVIR, ESA (through value-added industry), University of the West Indies (UWI), Ukrainian Space Agency, CSA (through value-added industry)

Recommendations

- GEOSS Registration:
  - CEOS Disaster SBA Team to review outputs of DI tasks to identify potential systems for registration

- Potential Achievements for Beijing to be reviewed in September:
  - Disaster video
  - Analysis of flood disaster needs and gaps (DI-06-09)
  - Results of 2010 Hurricane Season (Caribbean) and 2010 Namibian Flooding and Health Pilot (Africa) (DI-09-02B)

- Input for GEO 2012-2015 Workplan:
  - Develop implementation plan for multi-hazard end-to-end risk management
  - Consolidation of Caribbean Mitigation projects from Caribbean Satellite Disaster Pilot (regional implementation recommendations)
  - Consolidation of Southern African Flooding and Health Pilot results (regional implementation recommendations)

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Summary of Issues

Adopting Roadmap and implementing it via Tasks...

- Re-activating the inactive Sub-Tasks
- Integrating some activities into Tasks (e.g. Supersites)
- Broadening the Geohazard Showcase across SBA
- Integration of all types of observations
- Development of core sites to develop the integrated, multi-hazard, multi-risk approach advocated by GHCP
- Groundtruthing of remote sensing datasets
- Feeding observations, tools and value-added products into disaster management process and other SBAs...