CEOS Support to the GEO Geohazard Supersites Initiative

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Outlook

- Action from the Plenary
- Background
- Report the Tohoku-oki (Japan) earthquake
- New GEO task
- CEOS action
- Proposed deliverables and Milestones

CEOS Plenary action

24-17 **CEOS Agencies to review the GEO Geohazards Supersites White Paper and to respond to the data requests therein (including the urgent requests for the GEO Ministerial). Incoming CEOS Chair and SIT Chair will ensure suitable coordination and interface.** **REPORT AT SIT-26**

Current Status

CEOS Agencies have reviewed White Paper and have outstanding questions for GEO Task concerning:

- **Criteria and process for selection of geohazards sites**
- **Specific data requirements for each site and instrument for both archival data and future tasking with associated prioritization and rationale for a given instrument**

Background

- CEOS action DI-09-01a_4 in 2010 action plan
- Falk Amelung's presentation to the last CEOS Plenary at the invitation of the GEO secretariat
- GEO initiative to better understand the geophysical processes causing geohazards (earthquakes and volcanoes
- Expectation from CEOS Plenary was:
  - endorsement of White Paper by Space Agencies (by Oct 23 2010)
  - smooth data provision through CEOS
  - data provision for Wenchuan, Haiti Supersites prior to GEO Plenary (by 1 November 2010) : ESA provided data, others are in progress.

Haiti earthquake, January 2010

Summary:

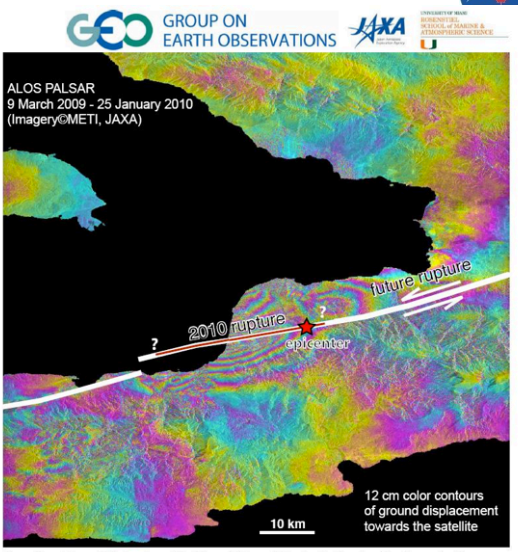
Fatalities: 230,000

Charter: TSX, RSAT-2, ALOS, Envisat

Supersites: ALOS and ESA

ALOS-PALSAR data led to 2 *Nature Geosciences* articles!

Early scientific understanding of quake helped focussing response efforts
→ Miami conference on Haiti 3/10



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

Sep 2010, Feb 2011 Christchurch earthquakes

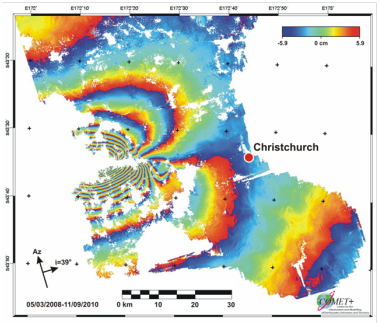
Summary:

Fatalities: 166

Charter: TSX, RSAT-2, ALOS

Supersites: None.

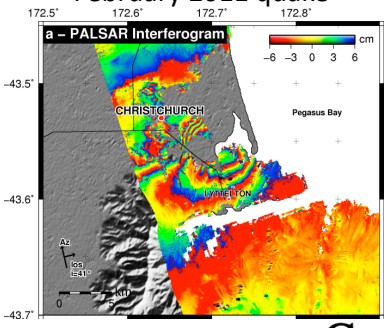
September 2010 earthquake



Excellent ALOS-PALSAR interferometry

Opportunity to understand earthquake triggering

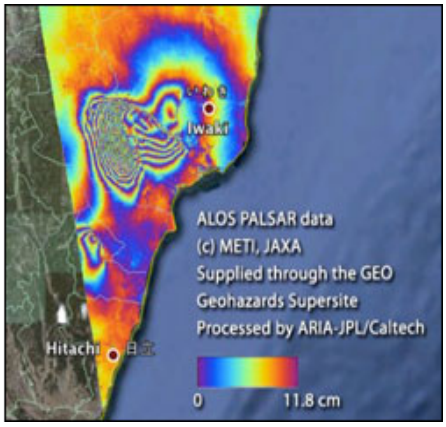
February 2011 quake



By J. Elliott, Z, Li, U.K.

GEO's Tohoku-oki (Japan) earthquake supersite (GEO News 14)

- To infer where and by how much the ground moved, scientists use the InSAR technique
- combined with in-situ data and GPS networks
- to iunderstand the processes along the interface between the two tectonic plates that moved during the earthquake
- The results show that during the 2-3 minute earthquake the Pacific plate dove by more than 20m under the Eurasian plate
- The direct impact of the GEO Supersites is difficult to measure.
- The long-lasting legacy of the Supersites will hopefully be that it triggers research projects around the world that will ultimately lead to a better assessment of earthquake and tsunami risk



Building on Success - Lessons Learned

- Space based observational needs are not band limited; a full suite of SAR (L-, C- and X-band) and optical measurements are needed to satisfy GEO requirements.
- A pilot set of candidate supersites and natural laboratories has been defined with criteria for additional potential sites and event supersites.
- Data are flowing from CEOS agencies and are being well used.
- Portals for data access have been established and are working.
- Plans are underway for improvements to data access at UNAVCO and the development of the COVE tool for tasking
- Focus should be on Science and research
- Supersite should not be confused with the charter

DI-09-01: Systematic Monitoring for Geohazards Risk Assessment c) Supersites and Natural Laboratories

This sub-task is led by USA (University of Miami) and ESA (wolfgang.lengert@esa.int), and supported by the Geohazards Community of Practice

Develop an international, sustainable and integrated approach to geohazards risk assessment, optimally utilizing the remote-sensing capabilities of GEO Members and Participating Organizations. Promote 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 stimulate fundamental research. The initial objective is to dramatically enhance access to multisatellite SAR data, GPS data, and seismic data for the seven Phase1 Supersites and event Supersites (connected to geological disasters). Intermediate objectives are to: (i) Develop a Supersite data portal (one-stop internet access point for in-situ and remote sensing geophysical data); (ii) Facilitate SARdata access for other selected regional areas exposed to geological threats (Natural Laboratories); (iii) Better demonstrate the power of the Supersite concept to improve geohazards risk assessment; and (iv) Develop a governance structure for the Supersites with representation from the science community and operational users.

DI-09-01c_1 action
Proposed deliverables & Milestones

- June: CEOS agency coordination meeting
  - Develop understanding of the need and identify what can be done.
- September: interact with GEO community.
  - GEO community to prioritize their requests and provide actionable guidance on future acquisitions.
- CEOS plenary in November 8-9:
  - Present plan & process
- GEO VIII report

CEOS agency coordination meeting

Outcome of this meeting would be

- A position relative to the proposed structure
- A clear understanding of what defines a supersite/natural laboratory and how these are selected,
- Specification of a well defined set of information needs that can be used by each agency to identify needed archival imagery and/or tasking and evaluate associated potential resource requirements
- Understanding of CEOS agency procedures to consider and authorize access to archival data and/or tasking of new acquisitions of GEO requested data, along with the associated timeframes and/or resource limitations that impact prioritization of data requests
- Feedback and reporting mechanisms. What do CEOS agencies need back from GEO to demonstrate the use, utility and effectiveness of data provided.
- Discussion of unique or complimentary roles of L-, C-, and X-band SAR data sets, associated priorities tied to information use scenarios, and potential opportunities for distributing the load (shared tasking or other)

Interaction with GEO community

Outcome of this meeting would ideally be GEO/CEOS team concurrence on

- Agreement on the approach
- draft plan on event supersite protocols
- draft plan on archival data needs and new tasking by site and instrument, taking into account unique/complimentary nature of L-, C-, X-band data and also agency limitations (resources, data policy, etc.)
- GEO data archive and access plans
- feedback and reporting mechanisms
- Draft materials or statement for GEO/CEOS Plenary